Whalsay Transport Link
STAG Report

ZetTrans
May 2008

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Executive Summary

Introduction

ZetTrans commissioned Faber Maunsell to undertake a detailed examination of options with regard to the transport link between Whalsay and the Shetland Mainland[1]. The analysis follows Scottish Transport Appraisal Guidance (STAG[2]). This note summarises the STAG process undertaken in order to reach a preferred option to be considered for funding.

The 'Do Nothing' option is considered to be unacceptable. Currently the route suffers capacity constraints at peak times which is reported to be hampering the commuter base of the island. Almost one quarter (22% or 160 residents) of the working population on Whalsay commute to the Mainland and depend on a regular and reliable ferry service. Current issues with capacity lead to uncertainty about being able to travel which can cause personal stress to people and potentially make continued commuting to the Mainland untenable. Added to this is the uncertainty regarding the state of the infrastructure and the vessels serving the route. The infrastructure is currently operating at its limit in terms of berthing pressures with ever increasing maintenance costs required to keep the service operational. The route is served by two vessels, MV '*Linga'* and MV '*Hendra'.* MV 'Hendra' was recently refurbished to extend her serviceable life but it is not anticipated that this could be extended further and she will need to come out of regular service use in approximately 2014; waiting time on new ferries is three years and can be potentially up to five years.

These factors all combine to provide a bleak future picture for Whalsay under the 'Do Nothing' scenario with ongoing capacity constraints hampering access to economic activity for residents of the island and increasing likelihood of service disruptions due to the aging infrastructure and vessels. All of this could serve to make living on Whalsay and commuting to the Mainland untenable which could in turn generate population decline on the island as people move off in search of employment opportunities.

Whalsay is the most populated of the Shetland Islands and the Whalsay route is the third busiest on the Shetland network. The route has been experiencing sustained and continued growth in passenger and vehicle numbers.

Problems and Opportunities

Analysis of the problems and opportunities has been undertaken and found the key problems to be:

- Aging vessels and changing legislation with regard to ferry design standards which affects the medium term use of MV 'Hendra';
- Aging infrastructure and increasing berthing pressures and increasing rate of wear and tear on the terminal infrastructure;
- Vehicle capacity problems aboard the ferries, particularly during peak commuting times, as well as problems related to the booking system and service gaps - commuting to the Mainland is essential for 22% of the working population on Whalsay (approximately 160 people);
- Restricted capacity for HGVs and taller vehicles on MV 'Linga'; due to competition for space the vehicle deck, there can be lengthy delays for larger vehicles;
- Marine congestion in Symbister Harbour;
- Concern regarding affordability, both in terms of affordability of fares as well as the importance of finding an affordable solution for funding bodies; and

[1] Shetland Mainland will be referred to simply as the Mainland within the remainder of this document which is distinct from the "Scottish Mainland" or "UK Mainland"

[2] STAG is the official appraisal framework developed by the Scottish Government to aid transport planners and decision-makers in the development of transport policies, plans, programmes and projects in Scotland.

- Concerns expressed over the operational reliability of the ferries with regard to operation in inclement weather as well as continuation of service during times of repair and routine maintenance.

Statutory Context and Planning Objectives

National, regional and local policies have been reviewed as part of this study and common theme is the emphasis on the importance of efforts to sustain island communities, and accept that local and central funding will be central to the sustaining of these, often isolated, populations.

Following assessment of the problems, opportunities and statutory context for the study a list of planning objectives was prepared. These objectives are six-fold:

- To deliver a solution that is affordable (for funding bodies);
- To deliver a solution that is operationally sustainable;
- To at least maintain the current level of accessibility to the island;
- To reduce conflict between ferry and other harbour users;
- To better match supply and demand; and
- To ensure that the socio-economic characteristics of the island are not constrained.

Option Generation and Sifting

A long list of options was generated and sifted to produce a list of options for appraisal. The following list shows those that were appraised at STAG Part 1 and Stag Part 2 and the outcome of this appraisal:

- ***Option 1 ('Do minimum' option)*** *– This option would see Laxo and Vidlin, renewed or replaced on a like-for-like basis and the current location of the Whalsay terminal within Symbister Harbour, renewed or replaced on a like-for-like basis; MV 'Linga' and MV 'Hendra' would be retained until life expiry, then replaced on a broadly like-for-like basis.*

This option provides an essential benchmark against which the other options can be compared. It performs only marginally better that the Do Nothing scenario however as it does not address the capacity constraints and would see the uncertainty involved with commuter travel continue. Congestion issues at Symbister would continue and the socio economic prospects for Whalsay would be compromised. The option has little impact on the environment, safety, integration or accessibility.

- ***Option 2*** *- Laxo is retained as the Mainland terminal, with Vidlin retained as diversionary terminal. Both terminals are replaced with new, larger terminals capable of accommodating 31 vehicle capacity vessels. Symbister remains the Whalsay Ferry terminal but is extended to be capable of accommodating 31 vehicle capacity vessels. One new 31 vehicle capacity vessel is introduced to operate alongside MV 'Linga'*

This option sees the capacity constraints addressed in the medium term and allows the route to grow whilst also removing the current uncertainties with commuter travel. The terminal upgrades would improve their reliability. Two options were investigated for extending Symbister; an outward and inward extension. The outward extension allows greater separation of the marine traffic and better addresses the issue of congestion at Symbister but the risks involved with constructing a breakwater in deep water and the risks involved with the construction (whereby the existing northern breakwater would have to be removed thus leaving the harbour exposed) have been deemed too significant to take this option forward. The outward extension was therefore dropped following STAG Part 1 appraisal. The inward extension of Symbister allows the larger ferries to make use of the harbour but does not fully address the congestion issues within the harbour. This option has little impact in terms of the environment, accessibility, integration or safety.

- ***Option 3*** *– Option 3 is the same as option 2 in infrastructure terms but sees two new 31 vehicle capacity vessels introduced onto the route*

As above with option 2, the outward extension of Symbister is ruled out due to technical risks; the inward extension is retained but does not fully address the congestion issues at the harbour. The introduction of two new 31-vehicle vessels onto the route addresses the capacity constraints but is significantly more expensive in the early years when compared with option 2.

The introduction of two new larger vessels is therefore considered unnecessary when one new larger vessel operating alongside MV 'Linga' addresses the capacity constraints and this option has been dropped after STAG Part 2 appraisal.

- ***Option 4*** *- Laxo is retained as the Mainland terminal, with Vidlin retained as diversionary terminal. Both terminals are replaced with new, larger terminals capable of accommodating 31 vehicle capacity vessels. The Whalsay Ferry Terminal is relocated to North Voe with a new terminal constructed capable of accommodating 31 vehicle capacity vessels. One new 31 vehicle capacity vessel is introduced to operate alongside MV 'Linga'*

This option sees the capacity constraints addressed in the medium term and allows patronage on the route to continue to grow whilst also removing the current uncertainties with commuter travel. The terminal upgrades would improve their reliability. Developing North Voe addresses the congestion issues at Symbister and provides a more efficient operational arrangement. Due to developing an undeveloped voe, this option, has negative environmental impacts in terms of landscape and visual impacts. It has little impact on safety, integration or accessibility.

- ***Option 5*** *– Option 5 is the same as option 4 in infrastructure terms but sees two new 31 vehicle capacity vessels introduced onto the route*

As above with option 4, the relocation of the ferry terminal to North Voe has environmental impacts but addresses the issues of congestion at Symbister harbour an, through the introduction of larger vessels addresses the capacity constraint issues. The introduction of two new larger vessels is therefore considered unnecessary when one new larger vessel operating alongside MV 'Linga' addresses the capacity constraints and this option has been dropped after STAG Part 2 appraisal.

- ***Options 6 and 7*** *– These were the fixed link options of a bridge and tunnel respectively*

Fixed links would provide a long term solution to capacity issues and remove uncertainty for commuter traffic. It would address the issues of congestion at Symbister. However, in light of the relative urgency to provide a solution for the Whalsay transport link and the timescales involved in constructing such a fixed link and the competing demand for fixed links from other islands within Shetland it is not considered that a fixed link is a feasible solution in the medium term for Whalsay.

- ***Option 8*** *– Grunna Voe is developed as the Mainland terminal and Vidlin is not upgraded as diversionary terminal since the attraction of Grunna Voe is more sheltered berthing conditions and therefore an anticipated reduction in the number of diversions that would be required. Symbister is retained as the Whalsay Ferry Terminal and is upgraded to be capable of accommodating 31 vehicle capacity vessels. One new 31 vehicle capacity vessel is introduced to operate alongside MV 'Linga'*

This option addresses the capacity constraints in the medium term. However, following detailed assessment of weather records, etc. concern exists about the performance of this option in inclement weather since Vidlin would not be upgraded and would therefore not be capable of accommodating the larger vessel. At these times the service would reduce to being served by only MV '*Linga'*. In this sense, the option does not address the uncertainty issues which affect commuter traffic. Additionally, this option sees a largely undeveloped area at Grunna Voe developed to provide a ferry terminal with the associated visual and landscape impacts. The option also introduces additional journey time for vehicles accessing / egressing Grunna Voe compared with Laxo with associated negative TEE and safety impacts. The option has little impact on accessibility and integration. Due to the poor performance of this option in economic terms and the environmental impact and the inability of the option to address the uncertainty issues affecting commuter traffic, this option has been dropped following STAG Part 2 appraisal.

- ***Option 9*** *– Grunna Voe is developed as the Mainland terminal and Vidlin is not upgraded as diversionary terminal since the attraction of Grunna Voe is more sheltered berthing conditions and therefore an anticipated reduction in the number of diversions that would be required. The Whalsay Ferry Terminal is relocated to a new ferry terminal at North Voe capable of accommodating 31 vehicle capacity vessels. One new 31 vehicle capacity vessel is introduced to operate alongside MV 'Linga'*

As above, this option addresses the capacity constraints in the medium term, however it does not address the uncertainty issues which affect commuter traffic. This option has negative impacts on TEE and safety associated with increased length of journey accessing / egressing Grunna Voe and has the negative environmental impacts of developing North Voe. The option has little impact on accessibility and integration. Due to the poor performance of this option in economic terms and the environmental impact and the inability of the option to address the uncertainty issues affecting commuter traffic, this option has been dropped following STAG Part 2 appraisal.

A full appraisal has been undertaken for the options and the key monetary summaries are provided in the table below.

	PVB	PVC	NPV	BCR*
Option 1 – Do-Minimum	£7,787,840	(£30,543,449)	(£22,755,609)	0.25
Option 2 – Symbister with extension, plus upgraded Laxo terminal, plus one new 31-vehicle ferry vessel and MV '*Linga*'	£9,235,932	(£64,437,157)	(£55,201,226)	0.14
Option 3 – Symbister with extension, plus upgraded Laxo terminal, plus two new 31-vehicle ferry vessels	£9,641,710	(£74,566,203)	(£64,924,493)	0.13
Option 4 – North Voe terminal, with Laxo terminal, plus one new 31-vehicle ferry and MV '*Linga*'	£9,235,932	(£60,821,128)	(£51,585,197)	0.15
Option 5 – North Voe terminal, with Laxo terminal, plus two new 31-vehicle ferries	£9,641,710	(£70,950,174)	(£61,308,464)	0.14
Option 8 – Grunna Voe, plus one new 31-vehicle ferry and MV '*Linga*', plus Symbister terminal with extension	£8,127,956	(£63,627,705)	(£55,499,749)	0.13
Option 9 – Grunna Voe, plus one new 31-vehicle ferry and MV '*Linga*', plus North Voe terminal	£8,127,956	(£60,011,676)	(£51,883,720)	0.14

*Ratio not monetary value

Taking this information along with the assessment of the performance of the options against the planning objectives, the government objectives and technical and deliverability issues, the preferred option has emerged as Option 4.

Summary and Conclusions

The STAG analysis examined the benefits and disadvantages associated with each of the option packages. Through careful appraisal against the study objectives and against the five national transport strategies, the recommended preferred Option comprises the following elements:

- Retention and maintenance of *MV 'Linga'*
- Introduction of one larger-sized ferry vessel (31 vehicle capacity) to replace MV '*Hendra';*
- Upgrading of Laxo ferry terminal to accommodate larger-sized ferries;
- Development of North Voe as a replacement ferry terminal on Whalsay; and
- Upgrade of Vidlin to remain as diversionary port capable of accommodating the larger ferry and MV '*Linga*'.

The next steps for this study would be to finalise designs for each of the terminals in order that the works can be procured. For this, North Voe requires a degree of testing to determine the position of the breakwaters and to ensure the facility can be built in the Voe as anticipated.

The STAG study outputs should be revised following such works to ensure the preferred option is still the preferred option and stacks up against the others in terms of delivering against the objectives.

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Introduction

1 Introduction

1.1 Introduction

Faber Maunsell has been commissioned by ZetTrans to provide consultancy services for the Whalsay STAG study. The transport link connecting the island of Whalsay to the Shetland Mainland[3] has been faced with a number of issues, the central focus of which concerns the aging infrastructure and the potential inoperability of the transport link in the medium- and long-term. The study follows a STAG Part 1 study undertaken in 2005 and was commissioned to begin in 2007 following outcomes from the ZetTrans' Regional Transport Strategy (RTS).

ZetTrans' RTS was submitted to Scottish Ministers in March 2007 and has recently been revised to Final Draft in April 2008; this document states, *"It is known that there is a relatively urgent requirement to address peak period vehicle deck capacity issues on Whalsay and [other inter-island routes]".* The RTS proposes, as a priority action item, finalisation of the option appraisal work for the Whalsay transport link.

Following action items identified in the ZetTrans' RTS, ZetTrans commissioned Faber Maunsell in September 2007 to undertake a detailed examination of options with regard to the transport link between Whalsay and the Mainland. The analysis follows STAG Part 2 protocol in order to further examine transport options identified in the STAG Part 1 report. This report outlines the steps and analysis taken within the entire STAG process in order to reach a preferred option to be considered for funding.

The 'Do Nothing' option for Whalsay is considered to be unacceptable. Currently the route suffers capacity constraints at peak times which is reported to be hampering the commuter base of the island. Almost one quarter (22% or 160 residents) of the working population on Whalsay commute to the Mainland and depend on a regular and reliable ferry service. Current issues with capacity lead to uncertainty about being able to travel which can cause personal stress to people and potentially make continued commuting to the Mainland untenable. Added to this is the uncertainty regarding the state of the infrastructure and the vessels serving the route. The infrastructure is currently operating at its limit in terms of berthing pressures with ever increasing maintenance costs required to keep the service operational. The route is served by two vessels, MV *'Linga'* and MV *'Hendra'.* MV *'Hendra'* was recently refurbished to extend her serviceable life but it is not anticipated that this could be extended further and she will need to come out of regular service use in approximately 2014; waiting time on new ferries is three years and can be potentially up to five years.

These factors all combine to provide a bleak future picture for Whalsay under the 'Do Nothing' scenario with ongoing capacity constraints hampering access to economic activity for residents of the island and increasing likelihood of service disruptions due to the aging infrastructure and vessels. All of this could serve to make living on Whalsay and commuting to the Mainland untenable which could in turn generate population decline on the island as people move off in search of employment opportunities.

1.2 STAG Appraisal

STAG is the official appraisal framework adopted by the Scottish Government to aid transport planners and decision-makers in the development of transport policies, plans, programmes and projects in Scotland. It is a requirement that all transport projects for which Scottish Government support or approval is required, are appraised in accordance with STAG.

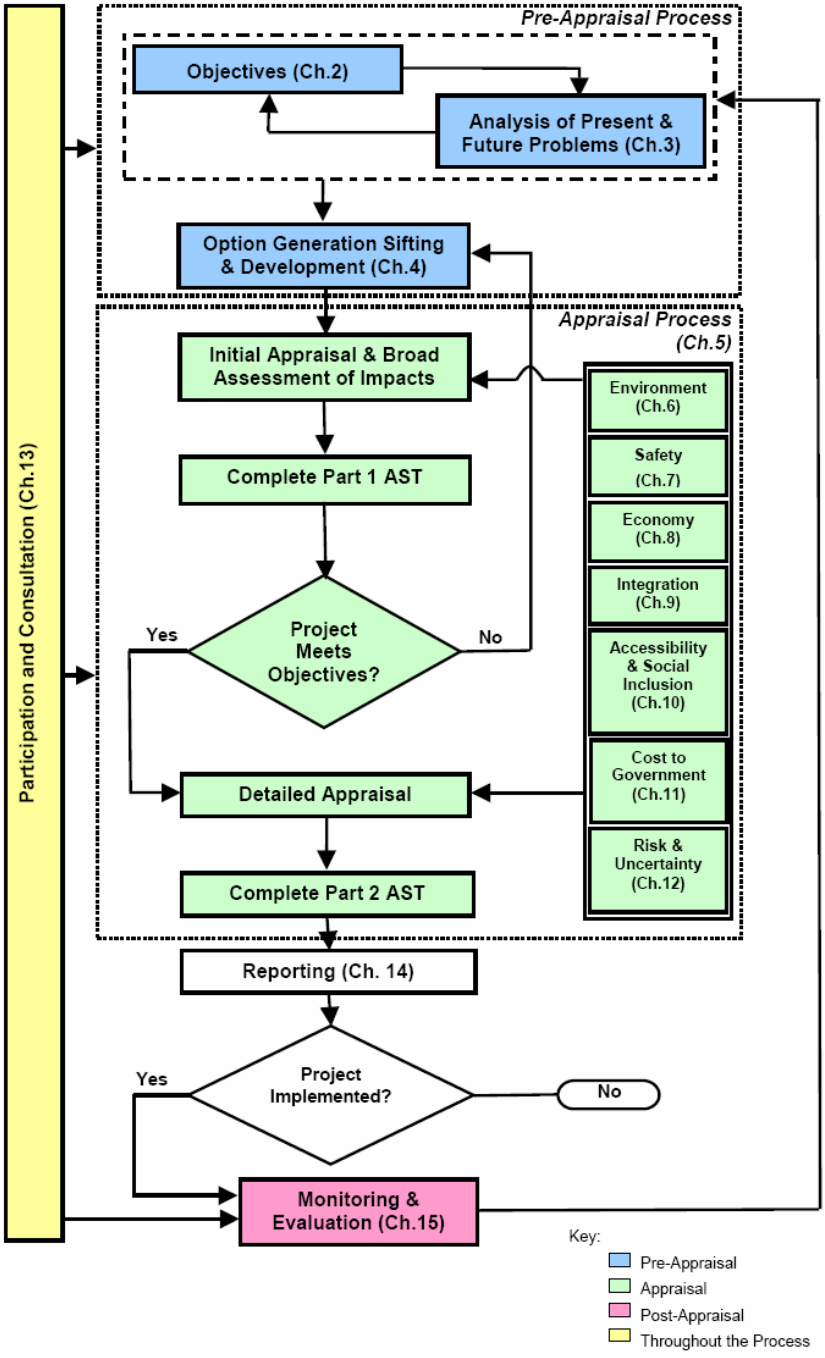
STAG has three parts:

[3] Shetland Mainland will be referred to simply as the Mainland within the remainder of this document which is distinct from the "Scottish Mainland" or "UK Mainland"

- Pre-Appraisal: project objectives are established with key stakeholders; an analysis of present and future problems, constraints and opportunities; and option generation sifting and development;
- Part 1 report: initial appraisal and broad assessment of impacts, designed to decide whether a proposal should proceed, subject to meeting the planning objectives and fitting with relevant policies; and
- Part 2 report: detailed appraisal of the options taken forward from the Part 1 appraisal with specific consideration to the Government's objectives, cost to government and risk and uncertainty.

Figure 1.1 shows the STAG appraisal process.

Figure 1.1 STAG Appraisal Process



Appraisal Summary Tables (ASTs) are used to present summaries of the appraisals: AST1 tables are used for Part 1 appraisals, and AST2 tables for Part 2 appraisals.

1.3 Appraisal Approach

The Pre Appraisal and STAG Part 1 elements of this study were undertaken in late 2004 / early 2005, reporting in June 2005. Following this, the Regional Transport Partnerships were formed, of which ZetTrans was one and it was necessary for the RTS to be developed considering the entire region of Shetland. Emerging out of this RTS was the need to continue the Whalsay STAG study as one of the key priorities.

Due to the time lapse between STAG Part 1 completing and STAG Part 2, a review of the STAG Part 1 has been undertaken to consider if anything has changed significantly in this time. It was found that whilst the key issues have remained relevant, elements and features of the funding context, initial assumptions and performance of Options identified in STAG Part 1 have been modified. The STAG Part 2 appraisal involved revisiting much of the STAG Part 1 appraisal as updated information emerged throughout the STAG Part 2 appraisal process altered the performance of various Options (including those which had been previously discarded or brought forward during the STAG Part 1 appraisal). For clarity of reading, this report has been structured to present the final appraisal of Options in order to clearly show the process by which a final preferred Option was reached.

The fundamental assumptions and pre-appraisal elements were all checked and these had not changed over the time period of the study. Developments since the initial STAG Part 1 appraisal was undertaken are discussed in section 1.5.

1.4 Overview of Study Context

The island of Whalsay is located approximately 5 miles east of the Mainland, which is located approximately 150 miles north of the Scottish Mainland. At the time of the 2001 census its population was recorded as 1,034

Unlike Shetland's other island communities which have seen an overall population decline, Whalsay has managed to maintain its population over the past few decades. The main hub of activity on Whalsay concentrates around the busy harbour at Symbister on the western coast of the island, and although there is some crofting on the island, Whalsay's economic development relies heavily on the fishing industry within which around a half of all jobs on the island are related.

For residents of Whalsay, the transport link to the Mainland is a lifeline service. Residents often require travel to the main town of Shetland, Lerwick, where there is a concentration of commercial, administrative and servicing activity. Figure 1.1 shows the ferry route from Whalsay at Symbister Harbour to the Mainland near Laxo.

Figure 1.2 The Ferry Route connecting Whalsay and the Mainland showing overview (left) and detail (right)

Overview of Whalsay – Mainland Ferry Route	Detail of Whalsay Ferry Route (Symbister Harbour to Laxo and Vidlin)
	

Whalsay is currently supported by a ferry service that operates from 06:30 hours to 23:00 hours every day. With two ferry vessels operating on the route, there are 36 scheduled sailings per day, offering departures from each terminal approximately 45 minutes throughout the day.

The two ferry vessels that normally operate on the Whalsay-Mainland route (also referred to as the Laxo - Symbister route), are MV *'Hendra'* and MV *'Linga'*. MV *'Hendra'* can accommodate 14 Passenger Car Units (PCUs). As an older vessel, MV *'Hendra'* is not expected to be operable much beyond 2014. MV *'Linga'* was introduced to the route in 2002, to replace the previous MV *'Thora'*. Capable of accommodating 16 PCUs, MV *'Linga'* is a newer vessel and is expected to be operational until 2027.

Inclement weather conditions (usually from the southeast) can render Dury Voe effectively un-crossable for MV *'Linga'* and MV *'Hendra'*, and during these times, the ferry vessels sail to Vidlin instead of Laxo. Diversionary sailings to Vidlin are more frequent in the winter months, when up to 40% of sailings can be diverted or cancelled altogether. In recent years, 8.2% sailings were diverted in the whole of 2005 and 9.0% were diverted in 2006. The Vidlin diversionary terminal is considered by the residents of Whalsay to be a core element of the Whalsay-Mainland transport link.

The over-arching issue facing Whalsay relates to the aging infrastructure of the transport link to the Mainland. Much of the current ferry infrastructure, with the exception of MV *'Linga'*, is reaching the end of its operational lifespan. The Laxo terminal, the terminal at Symbister and the diversionary terminal at Vidlin are currently being maintained at increasing costs and there is uncertainty regarding the ability to maintain the terminals in the medium- to long-term. There is concern that, without a reliable transport link to the Mainland, the socio-economic prospects for Whalsay will be constrained at best or unsustainable at worst.

This issue has been known for some period of time. The STAG study was originally commissioned in 2004 to examine options with regard to the transport link.

The study found a number of secondary issues that may be addressed as a final preferred option is identified. The first relates to recent EU legislation on the design of ferry ships, which stipulate particular design standards for improved safety. MV *"Hendra"* does not currently comply with these new standards albeit she is considered seaworthy and certified for service in the interim. Similarly, stakeholders identified marine congestion as a safety issue in Symbister Harbour, and as something to be addressed if an option was to be identified for the Whalsay-Mainland link.

A secondary issue relates to capacity constraints on the ferry vessel during peak periods (west-bound in the mornings and east-bound in the evenings), and it was considered that this constraint was jeopardising the population figures on Whalsay by placing journey stress on commuter sailings.

1.5 Structure of Report

This report provides details of the STAG process undertaken to assess the future transport links to Whalsay. This is set out within the following Chapters:

- Chapter 2 – Background and Study Context;
- Chapter 3 – Statutory Context;
- Chapter 4 – Analysis of Existing and Potential Problems
- Chapter 5 – Objectives
- Chapter 6 – Option Generation and Sifting
- Chapter 7 – Option Development
- Chapter 8 – Consultation
- Chapter 9 – STAG Part 1 Appraisal
- Chapter 10 – STAG Part 2 Appraisal;
- Chapter 11 – Environment;
- Chapter 12 – Safety
- Chapter 13 – Economy
- Chapter 14 – Accessibility and Social Inclusion
- Chapter 15 – Integration
- Chapter 16 – Costs and Deliverability
- Chapter 17 –Technical Considerations and Risk
- Chapter 18 – Monitoring and Evaluation
- Chapter 19 – Conclusions and Recommendations

Background and Study Context

2 Background and Study Context

2.1 Introduction

The following chapter provides an overview of the study area, in the context of Shetland. It details the existing transport connections related to Whalsay, prior to examining Whalsay's population and economic context.

2.2 Study Area

The Shetland Islands are located approximately 150 miles north east of the Scottish Mainland. There are over 900 miles of coastline covered over 100 islands. The main town of the Shetland Islands is Lerwick, which is located on the Mainland. Lerwick is the main focus for commercial, administrative and servicing activity on the island, and is where the largest concentration of population exists. External air links to Shetland are provided from Sumburgh airport, whilst ferry links to Aberdeen and Kirkwall are provided from Lerwick.

The island of Whalsay is located 5 miles to the east of the Mainland and the island is 5 miles long and 2 miles wide. The main hub of activity on Whalsay concentrates around the busy harbour at Symbister on the western coast of the island, and although there is some crofting on the island, Whalsay's economy relies heavily on the fishing industry within which around a half of all jobs on the island are related.

The total population of Shetland was 21, 988 at the 2001 census, and 18,606 (85%) are resident on the Mainland. Most of the remaining 3,382 residents are based on the nine islands detailed in Table 2.1. This also shows the resident population at the 1981, 1991 and 2001 censuses.

Table 2.1 – Island Population Trends, 1981-2001

Island	1981 Census	1991 Census	2001 Census	20 Year % Population Change
Bressay	334	352	384	+15.0%
Fair Isle	69	67	69	0.0%
Fetlar	101	90	86	-14.9%
Foula	45	42	32	-28.9%
Papa Stour	35	35	24	-31.4%
Skerries	88	87	76	-13.6%
Unst	1,140	1,055	720	-36.8%*
Whalsay	1,025	1,041	1,034	+0.9%
Yell	1,191	1,075	957	-19.6%

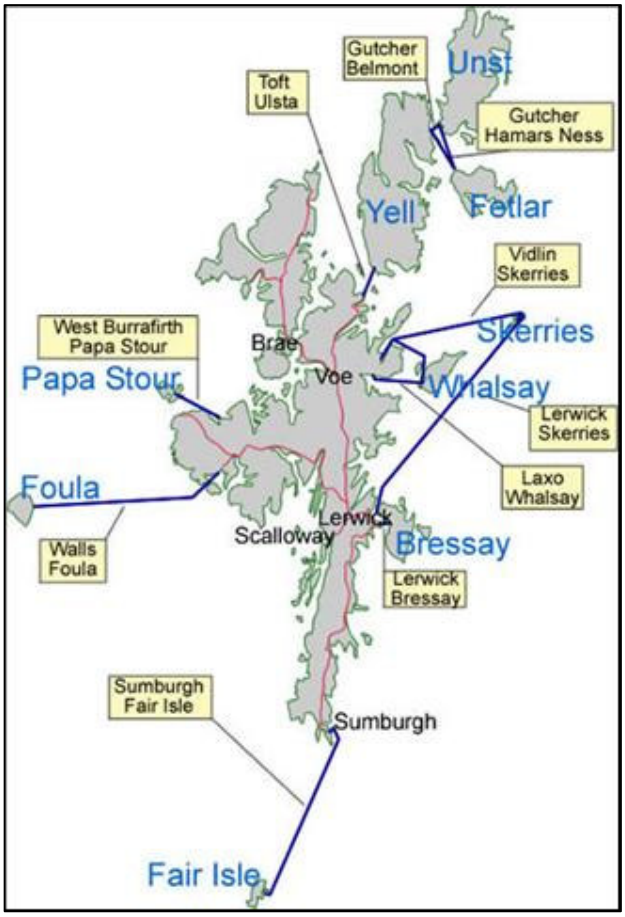
Source: Shetland in Statistics; * Population decline affected by closure of RAF Saxa Vord

It can be seen that Whalsay, Yell and Unst are the three most populated islands, with Whalsay providing 30% of the "island" population. It can also be seen that Whalsay, over the last twenty years, has been able to maintain a relatively stable total population, compared to population declines on other islands, with the exception of Bressay and Fair Isle.

2.2.1 *Shetland Islands Ferry Services*

Shetland Islands Council own and operate a fleet of 12 ferries that run from 15 terminals serving eight of the nine main islands[4]. Figure 2.1, below, shows the existing ferry services that operate throughout the islands.

Figure 2.1 – Map of Shetland Inter-Island Ferry Services



The most important ferry services in terms of utilisation are Yell (Toft-Ulsta), Bressay (Lerwick-Bressay), Whalsay (Laxo/Vidlin-Symbister), Unst (Gutcher-Belmont) and Fetlar (Gutcher-Hamar's Ness). Table 2.2 shows recent carryings on these five key routes.

Table 2.2 – Recent carryings on selected routes

Island	Route	2006 Passengers (000s)	2006 Cars (000s)
Yell*	Toft - Ulsta	250,381	154,966
Bressay*	Lerwick-Bressay	209,922	85,381
Fetlar / Unst	Gutcher-Hamar's Ness / Gutcher – Belmont	138,584	83,261
Whalsay*	Laxo/Vidlin – Symbister	166,016	83,589

Source: *BM Consulting

[4] The ferry service to Foula is contracted to Atlantic Ferries.

The figures presented above underline the importance of the Whalsay route as the third busiest. Further analysis of carryings since 1999 demonstrates a sustained year on year growth of 5.0% per annum of vehicle carryings on the Whalsay route, and 3.2% per annum growth in passengers.

The Yell Sound route has recently benefited from the provision of two new vessels and terminal upgrades. The Bressay route is subject to a STAG study which is considering the future provision of transport links, including continued ferry service, and provision of a fixed link.

2.3 Whalsay Ferry Service

The Whalsay ferry link, between Symbister and Laxo/Vidlin has a timetabled journey time of 30 minutes. Throughout the day, the route is served by two vessels, which reduces to one in the evening.

Figure 2.2 – Map of Symbister – Laxo/Vidlin Ferry Service

Overview of Whalsay – Mainland Ferry Route	Detail of Whalsay Ferry Route (Symbister Harbour to Laxo and Vidlin)
	

The current Whalsay service timetable is shown below in Table 2.3. This provides a total of eighteen return crossings Monday to Saturday, and fourteen return crossings on Sundays (due to maintenance and crew drill requirements). The last return sailing of the day is undertaken on a "bookings only" basis. Vidlin ferry terminal is used as a diversionary port during periods of adverse weather. It is noted that the use of Vidlin can continue for extended periods, particularly during the winter months, following periods of strong south-easterly wind and swell. When the ferry is using Vidlin, it is noted that the timetable can be difficult to maintain, principally due to the longer sea crossing that is required to reach Vidlin, compared to Laxo.

Table 2.3 – Whalsay service timetable (Summer 2007)

Monday to Saturday		Sunday	
From Symbister	From Laxo	From Symbister	From Laxo
06.30	07.10	06.30	07.10
07.00	07.50	07.50	08.30
07.50	08.30	09.15	10.30
08.25	09.35	10.30	11.15
09.15	10.30	11.15	12.00
10.30	11.15	12.00	12.45
11.15	1200	14.00	14.45
12.00	12.45	15.30	16.15
12.45	14.00	16.15	17.00
14.00	14.45	17.00	17.50
14.45	15.30	17.45	18.30
15.30	16.15	19.00	20.30
16.15	17.00	21.15	22.00
17.00	17.50	22.35*	23.10*
17.45	18.30		
19.00	20.30		
21.15	22.00		
22.35*	23.10*		

*Sailing will only take place if a booking is made before close of travel office.

Sample fares on the services are advertised as in Table 2.4.

Table 2.4: Sample service fares

Fare Category	Price
Adult Return	£3.30
Adult 10 Return Journey Ticket	£15.80
Vehicle (up to 5.5m) + Driver	£7.80
Vehicle (up to 5.5m) + Driver 10 Return Journey Ticket	£62.00

The busiest sailings on the route are typically the 07.50 from Symbister, and the 17.50 departure from Laxo. These sailings are typically fully booked for vehicles on a daily basis. There is further evidence of strong recent growth on other sailings potentially suitable for commuting to the Mainland, particularly for vehicles.

2.3.1 *Vessels*

The Whalsay ferry service is currently typically operated by two vessels, MV *'Linga'* (16 vehicle capacity) and MV *'Hendra'* (14 vehicle capacity). MV *'Hendra'* was introduced to the route, following reburbishment to extend its operational life to 2014, to replace MV *'Geira'*. Other vessels have been used on the route, including the fleet relief vessels MV *'Bigga',* and MV *'Thora'*. A profile of these vessels is provided within Table 2.5 below.

Table 2.5 – Vessel Profiles

Vessel	Vehicle Capacity (PCUs)	Passenger Capacity	Year of Construction
MV *'Bigga'*	16	95	1991
MV *'Geira'*	11	86	1988
MV *'Hendra'*	14	95	1982
MV *'Linga'*	16	95	2002
MV *'Thora'*	11	92	1975

Being the most recent vessel on the route, MV *'Linga'* benefits from a superior level of passenger comfort, with passenger accommodation provided above the car decks in twin saloons. This is in contrast with the older vessels where passenger accommodation is provided in a saloon beneath the car deck.

Photos of MV *'Linga'* and MV *'Hendra'* are provided below.

Figure 2.3: MV *'Hendra'* (left) and MV *'Linga'* at Laxo (right).

2.3.2 *Terminals*

Three ferry terminals are utilised by the service; Symbister, Laxo and Vidlin.

Symbister terminal is located within Symbister Harbour. This is a busy harbour, used by a variety of different types of vessels, and is shown in Figure 2.4 below.

Figure 2.4 – Symbister Harbour

In the deep-water outer harbour, Whalsay's fleet of Pelagic Trawlers are typically moored during periods of lay-over. Whilst seven vessels are owned by Whalsay fishermen, the outer basin has a maximum capacity for six of these vessels.

In the next basin, which has shallower water, Whalsay's smaller white fish (7 vessels), shell fish (21 vessels) and single salmon coaster vessels are moored.

A number of ferries berth on the inner pier within the harbour – the two Whalsay/Mainland ferries, and the Skerries ferry MV *'Filla',* which moors overnight at Whalsay. Other relief vessels are also occasionally moored in the harbour.

Finally, the most southerly part of the harbour is utilised by a marina. This provides berthing for 80 vessels, over two pontoons.

The outer basin (the area currently occupied by the pelagic fleet) was added in the early 1980s, whilst the marina was added in the early 1990s.

The ferry terminal was completed in the 1970's as part of the Mainland-Whalsay section of the inter-island ferry network. The terminal and lay-by berths are situated at the inner pier. This was itself constructed during the 1950's, with the outer arm completed in 1968. The terminal is well-situated for direct pedestrian and vehicle access to Symbister, which is the main centre of activity and population on Whalsay. A toilet block is provided adjacent to the ferry terminal and a portakabin accommodates the booking office. An electronic variable message sign is provided to inform passengers of ferry information.

The Mainland ferry terminal at Laxo is situated near the head of Dury Voe. Situated off the B9071, it is easily accessible, located some 5km from the main A970 "Spine Road". Facilities at Laxo include toilets, a waiting area, parking facilities, a public telephone and an electronic variable message sign. Observations confirm evidence of cars being left on the Mainland during the working week, as well as a large amount of informal car-sharing amongst commuters. Figure 2.5 shows the Laxo terminal.

Figure 2.5 Laxo Ferry Terminal

The Vidlin terminal is located 4km north east of the Laxo terminal and accommodates the ferries from Whalsay that divert to this terminal during periods of inclement weather conditions. It also provides the principal Mainland terminal for the Mainland-Out Skerries ferry service. Facilities at Vidlin include a public telephone, toilet, electronic variable message sign and limited parking spaces. Access to the ferry terminal for vehicles and pedestrians is through the centre of the village. The use of Vidlin as a diversionary port is relatively convenient, as both Laxo and Vidlin are situated on the same road link. Figure 2.6 shows the Vidlin ferry berth.

Figure 2.6 Vidlin Ferry Berth

2.3.3 *Road Access*

The main road to the ferry terminal at Symbister Harbour generally serves the island adequately, given the number of users, and is believed to be in a relatively good standard. Work has recently been undertaken providing continuous footpaths alongside the road, and further pedestrian improvements are planned.

On the Mainland, the B9071 is the main road leading from the Laxo terminal to the A970 which travels to Lerwick. The B9071 is a two-lane carriageway between the terminal at Laxo to the A970 and this road is also believed to be in good standard. The same applies to the main arterial A970 road which travels down the spine of the Mainland to Lerwick.

The route from Laxo to Vidlin is also taken via the B9071, although this stretch of road is of a poorer standard. Although the B9701 is a two-lane road westward between Laxo and the A970, the road eastwards towards Vidlin is single carriageway. There are few passing places on this road, and concerns arise when ferries are diverted to Vidlin. On such occasions, conflict can occur between vehicles attempting to catch a ferry departure from Vidlin, and those vehicles recently disembarked at Vidlin.

2.3.4 *Public Transport*

Andrew's Coaches operate a bus service that collects passengers from the Laxo terminal twice a day during the main AM and PM commuter period. The earliest bus departs Laxo at 0820 to embark on the 30 minute journey to Lerwick. The second service departs Lerwick at 1705 and arrives in Laxo at 1745. This service also stops at Vidlin and will wait on ferry users when the Whalsay ferries have been forced to divert to Vidlin. Journey prices are £2.20 between Laxo / Vidlin and Lerwick. The full timetable is shown in Table 2.6.

Table 2.6 – Lerwick-Laxo-Vidlin-Lerwick Timetable (operated by Andrew's, The Dykes, Wormadale, Whiteness)

Monday – Saturday Lerwick to Vidlin	Departure Time (AM)	Departure Time (PM)
Lerwick (Viking Bus Station)	0735	1705
Lerwick, Esplanade	0736	1706
Tingwall North (crossroads)	0750	1720
Tingwall Hall	-	1723
Girlsta	0757	1730
Nesting Junction	0800	1735
Vidlin Junction	0805	1740
Laxo Ferry Terminal	-	1745
Vidlin PO	0810	1750
Monday – Saturday Vidlin to Lerwick	Departure Time (AM)	Departure Time (PM)
Vidlin PO	0810	1750
Laxo Ferry Terminal	0820	-
Vidlin Junction	0825	1800
Nesting Junction	0835	1810
Girlsta	0840	1815
Tingwall Hall	0843	-
Tingwall North (crossroads)	0846	-
Lerwick (Viking Bus Station)	0855	1830

2.4 Socio-Economic Analysis

A socio-economic review of Whalsay has been undertaken, based on analysis of recent census data[5], and information provided through our consultation, a review of "Shetland 2012", Shetland Local Economic Forum's Economic Development Strategy[6], and the Local Plan[7].

A good range of facilities is provided on Whalsay, which has the largest population of the nine main islands off the Mainland. This includes an 18-hole golf course, a modern leisure centre and a swimming pool. An outside "multi-court" has also been provided, along with a youth centre in Livister, and a snooker club in Symbister.

A care centre at Marrister provides short-term and long-term residential care and day care for older people and adults over 16. There are four general stores and one electrical retailer. Two of the stores sell fuel, and one operates the post office. Whilst a gravel airstrip is provided, currently this does not provide any scheduled services. However, it is frequently used to transport key service personnel to and from Out Skerries.

2.4.1 Population Trends

As highlighted previously, Whalsay has benefited from a relatively stable population between the last three censuses, of 1,031 in 1981, 1,041 in 1991 and 1,034 in 2001.

The age structure of Whalsay residents at the 2001 census is provided in Table 2.7 below.

[5] Source – www.scrol.gov.uk, accessed May 2005
[6] Shetland Economic Forum, Shetland 2012, April 2003
[7] Shetland Islands Council, Shetland Local Plan, 2004

Table 2.7 – Whalsay's Age Structure

Age Category	Percentage of Population at 2001 Census		
	Whalsay	Shetland Islands Council	Scotland
0-10	15.7%	14.5%	12.8%
11-20	13.6%	13.0%	12.7%
21-30	12.5%	11.9%	12.6%
31-40	13.8%	15.1%	15.6%
41-50	12.1%	14.4%	13.9%
51-60	12.6%	13.2%	12.3%
61-70	10.2%	8.4%	9.8%
>70	9.6%	9.4%	10.3%

Source: 2001 Census

The age structure reveals that the proportion of Whalsay's population between 0 and 10, and 10 to 20 years old is actually higher than the Shetland and Scottish average. It is noted that whilst the percentage of the population between 31 and 50 appears less than Scottish and Shetland average, the population of more elderly residents does not appear to be significantly higher than Scottish averages.

Figure 2.5 – Whalsay Age Structure Comparison 1991 to 2001

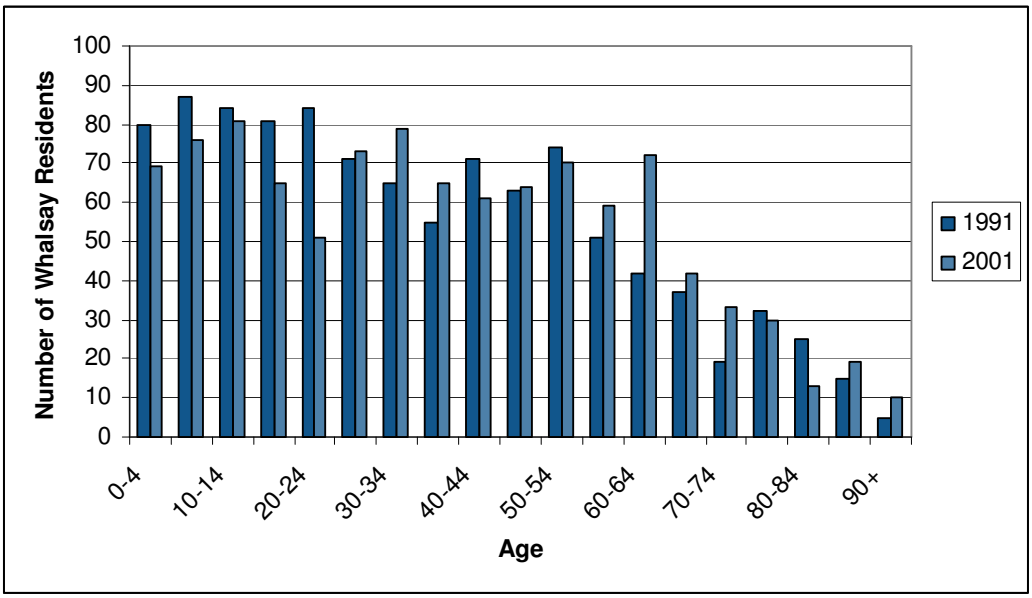


Figure 2.3 presents a comparison of 1991 and 2001 census data for Whalsay. The graph is further confirmation that the population has remained relatively stable over this ten-year period. However, there are some notable differences between 1991 and 2001. Firstly, in comparison to the 2001 census results, the number of people on Whalsay aged under 24 is below the comparable figures from the 1991 census. Comparison of the number of people aged between 20 –24 in 1991 and 2001 is particularly interesting, as in 1991 there were 84 Whalsay residents of this age (8.1% of Whalsay's total population) but by 2001, this figure had decreased to 51 (4.9% of Whalsay's total residents). This could reflect a lack of higher education or career opportunities in Whalsay.

2.4.2 *Housing*

The Local Plan states that the development of new housing units has been relatively buoyant over the last decade, with an average of six completions per year since 1994. Comparison of Scotland's census results between 1991 and 2001 supports this, as in 1991 there were 336 households on Whalsay, and in 2001, this figure had increased to 376[8].

2.4.3 *Education*

Whalsay has a primary school, nursery unit, and junior high school. "Shetland in Statistics"[9] presents historic school roll data for secondary schools across Shetland. In reference to Symbister House Junior High School, as Table 2.8 below reveals, the number of pupils attending secondary school in Whalsay has increased over the years from a total school roll of 36 in 1971 to a school role of 68 in 2002.

In terms of the number of primary school children attending Symbister House Junior High School, "Shetland in Statistics" suggests that this figure has generally decreased over the years. However, the number of nursery pupils attending Symbister House has steadily increased.

The Local Plan concludes that the total school roll, which totalled 191 in 2002, has been fairly stable over the last fifteen years.

Table 2.8 – School roll figures for Symbister House Junior High School

Year	1971	1976	1981	1986	1991	1996	2000	2001	2002	2004	2005	2006
Secondary school roll	36	54	62	49	45	50	64	66	68	64	65	60
Primary school roll	125	149	146	121	125	110	104	100	98	105	98	105
Nursery roll						19	21	23	25	24	24	25

Source: Shetland in Statistics (2003 data not available)

2.4.4 *Employment*

Of the 1,034 residents in Whalsay at the time of the 2001 census, 718 were aged between 16 and 74. Table 2.9 provides further detail of the status of these residents.

Table 2.9 – Economic Activity of Population on Whalsay, Shetland Islands and Scotland (residents aged 16-74) in 2001.

Category	Number	Percentage	Shetland Average	Scottish Average
Part Time Employed	126	17.6%	15.1%	11.1%
Full Time Employed	231	32.2%	45.1%	40.2%
Self Employed	131	18.3%	10.6%	6.6%
Unemployed	11	1.5%	2.4%	4.0%
Full Time Students	6	0.8%	1.9%	3.0%
Retired	92	12.8%	11.9%	13.1%
Students	13	1.8%	2.2%	4.3%
Looking after home/family	56	7.8%	5.1%	5.5%
Permanently sick/disabled	13	1.8%	3.8%	7.4%
Other	39	5.4%	2.7%	3.9%
Total Population Aged 16-74	718	100.0%	100%	100%

Source: 2001 Census

[8] Scotland's Census 2001 – Statistics for Inhabited Islands, GROS, 2003
[9] Shetland in Statistics, Shetland Islands Council, 2003

The main industries on Whalsay are fishing (20.3%), manufacturing (17.2%), transport, storage and communications (12.6%), health and social work (12.2%), education (9.3%), wholesale, retail trade, and repairs (7.5%), construction (4.9%), other (16.0%). Many jobs on Whalsay are either directly or indirectly connected to the fishing industry, which is divided into three sectors: white fish, pelagic fish and shell fish.

The unemployment percentages for Whalsay are lower than both the Shetland average and the Scotland average.

Comparison of census results between the 1991 and 2001 censuses show that employment rates on Whalsay, both for males and females, has significantly increased over this period[10]. For instance, the percentage of males aged between 16 and retirement age in employment has increased from 76.9% in 1991 to 83.0% in 2001. Female employment has also grown from 58.6% in 1991 to 71.8% in 2001.

2.4.5 *Travel to Work and Car Ownership*

2001 census data on travel to work trends on Whalsay show that of the population currently working or studying (i.e. excluding those not working, those working offshore, and those working outwith the UK), 66% are island based, 22% are Mainland based, 12% have no fixed location of work.

A trend of increasing car ownership on Whalsay between the 1991 and 2001 censuses[11] is also prevalent. Of particular interest is the fact that in 1991, 19.8% of households had no cars or vans available, whilst in 2001 this had decreased to 15.7%. Correspondingly, there has been an increase in households with two or more cars or vans available, from 31.6% in 1991 to 40.2% in 2001.

2.4.6 *The Pelagic fleet*

There are seven pelagic trawlers based in Whalsay. The vessels have crews of 11 to 14 men, with one vessel having a crew of 15. Approximately 90 jobs are directly supported by the Pelagic fleet. The first two months of the year focus on mackerel fishing. In March, around half of the vessels are catching blue whiting, with the other half laying up. No fishing activity takes place between April and July. The whole fleet is engaged in catching herring during August, with September again spent laying up. October through to the beginning of November is another period of catching mackerel. Most of November and December is again spent laying up.

Symbister Harbour is used by the Pelagic fleet for a number of reasons:

- A berth whilst they wait to land at the processing factory in Lerwick. This can extend to 2 or 3 days, occasionally 4 days.
- A berth for laying up during the periods when no fishing is possible. The vessels are typically manned by a crew member during this period to undertake routine maintenance tasks.
- Small repairs can be undertaken by the local repair firm whilst laying up at Symbister.
- Major repairs are undertaken in either Lerwick or Norway; fuel is generally purchased wherever it is cheapest, typically Lerwick or Norway. Provisions are taken from either the local Whalsay shop (especially after a period of lay-up), or the cash and carry store in Lerwick.

2.4.7 *The White Fish Fleet*

Historic levels of white fish vessels in Whalsay were once around twenty vessels, but are currently at five vessels. There has been a recent decline in white fish activity, mostly due to legislative restrictions, although there are now signs of a slight recovery or stabilisation taking place. The vessels typically have a crew of 4 or 5 on board at any one time, from a pool of around 8 to 10. This sector provides direct employment for around 50 men. The vessels fish in and around Shetland, and typically land in Lerwick once a week. The vessels can be in and out of Symbister once or twice a week.

[10] Scotland's Census 2001 – Statistics for Inhabited Islands, GROS, 2003
[11] Scotland's Census 2001 – Statistics for Inhabited Islands, GROS, 2003

Fuel and ice are taken in at Lerwick. Provisions and other stores are taken from Whalsay. Small engineering works can be undertaken using the Whalsay based firm, with repairs undertaken in and around Symbister Harbour. Net repairs are undertaken at the quayside at Symbister Harbour.

2.4.8 *Shell Fish Fleet*

Four shell fish vessels are based in Whalsay, working inshore waters. Typically, these fish for scallops, velvet crabs and prawns.

2.4.9 *Aquaculture*

The fish farm located to the west of North Voe is operated by Grieg Seafood Hjaltland.

2.4.10 *Fish Processing*

Whalsay Fish, the fish processing factory, is currently 100% owned by Shetland Leasing and Property, and supported by the Council. The workforce comprises of 65 employees. Five employees (all full-time) commute to Whalsay, 60 employees are island-based workers, 20 of which are part time. The factory processes Salmon which is sourced from Lerwick. The factory transports in graded (gutted) salmon, and hauls out fresh or frozen fillet. The factory does not have a gutting facility, and depends upon other local plants to supply its raw materials. Historically, the factory was concerned with the processing of white fish.

2.4.11 *Ferries*

Ferry staff account for 43 full time jobs on the island. This accounts for seven crews[12], split between the two Whalsay ferries, and the Out Skerries ferry. An additional employee mans the Whalsay booking office.

2.4.12 *Other Sectors*

There is only a limited amount of agricultural and crafting activity on the island and the remainder of the working population is based in the public sector and service sector. Many jobs are taken on the Mainland, enabled by the current ferry service.

2.5 Ferry Users Survey Overview

A two-day on-board survey was conducted in October, 2007, in order to examine utilisation levels and other travel information related to the existing ferry crossing connecting Whalsay and the Mainland. The survey covered 36 sailings, with a total of 274 responses representing an overall response rate of 59%. Full details of this survey can be found in Appendix A.

Most of the trips on the ferry either originated their journey in Lerwick or were bound for Lerwick, representing approximately 60% of all ferry users[13]. Other trips had their Mainland origin or destination in Brae (3%), Scalloway (3.7%), Sumburgh (2.7%), Sullom Voe (2.7%) and various other places in Shetland.

The majority of respondents who were travelling to the Mainland had begun their trip at home (89%) and were heading to work (57%), personal business (11%), shopping (9%), or for a variety of social visits or leisure opportunities (7% Visiting friends/relatives, 4% multiple social reasons, 1% leisure and entertainment).

Of respondents going to Whalsay, 46% had started their trip from home and 30% started their journey from work. Respondents travelled to Whalsay to get to work (51%) or for social (2%) or leisure and entertainment purposes (14%).

Most survey respondents indicated travelling by a vehicle, either as a sole occupant (40%), a car driver with passenger(s) (26%), or car passenger (23%). Less than 5% used walking as a mode of transport either to or from the ferry terminal.

Approximately 21% of foot passengers had a vehicle available to them but chose to either walk, cycle, take the bus or take the trip as a car passenger. The most often cited reason for not taking their vehicle related to the expense of travel and/or the lack of space on the ferry.

[12] There are three crews for *MV 'Linga'*, two crews for *MV 'Hendra'*, and two crews for *MV 'Filla'*.

[13] The Ferry User Survey found that, among ferry users travelling from Symbister to Laxo, 71% were bound for Lerwick. Among ferry users travelling from Laxo to Symbister, the survey found that 50% had originated their journey in Lerwick.

With respect to vehicle utilisation on the ferry, no vehicles were left behind at the ferry terminal during any of the 36 sailings over the survey period. MV *'Hendra'* appeared to approach or reach maximum capacity[14] more often (6 sailings) than MV *'Linga'* (one sailing).

The busiest sailings in terms of vehicle and total passenger usage were the west-bound sailings to the Mainland, particularly the 7:50am sailing on both days of the survey (Monday and Tuesday).

2.6 Summary

This Chapter has provided background information on the study area and has provided an overview of the main transport links within the study area. An overview of ferry operation on Whalsay, and throughout the Shetland Islands as a whole has been presented and it has been shown that the Whalsay route is the third busiest on the Shetland network and is experiencing growth in passenger and vehicle numbers. Focus has also centred on the vessels and terminals involved in sustaining this key ferry link between Whalsay and the Mainland.

This Chapter has also presented an overview of some of the main socio-economic trends on Whalsay. The key points to emerge from the social or demographic review of Whalsay are that:

- Whalsay has a relatively stable population, compared to population declines on most other islands;
- A good range of community facilities is provided on Whalsay;
- Whalsay has a higher than national average proportion of residents under the age of 15;
- The proportion of Whalsay's population aged 16 – 24 is below the Scottish average, perhaps reflecting the lack of new job or higher education opportunities on the island; and
- The proportion of population of pensionable age (61 – 70 years of age) on Whalsay is comparable to the Scottish average.

An economic review has also been undertaken and the main issues to emerge from this included:

- Fishing is the predominant industry on Whalsay;
- Jobs in the fishing industry are divided between the white fish, pelagic fish and shell fishing sectors, aquaculture, or the fish processing factory;
- Jobs related to the ferry service employ a considerable number of people in Whalsay;
- There is only a limited amount of agricultural and crafting activity with the majority of other jobs based in the public and service sector;
- Travel to work data reveals a high commuting rate to the Mainland, where 22% of Whalsay's population travel to work; and
- 66% of Whalsay's working population are island based and 12% have no fixed location of work.

In addition, this Chapter presented findings from the Whalsay Ferry Users Survey conducted in the Autumn 2007. The survey found that commuter sailings were the busiest in terms of vehicle and passenger usage, and that most ferry users travelled by car, either as a driver or as a car passenger. The survey indicated that a majority of ferry users either originated from or were bound for Lerwick. Approximately a fifth of foot passengers chose not to take a vehicle on board the ferry despite having a vehicle available to them, the most often cited reason for which related to the expense of travel and/or the lack of space on the ferry.

[14] Maximum capacity is defined as >90% full. On the *Hendra*, maximum capacity refers to one or no unused space on the ferry. On *MV 'Linga'*, maximum capacity is defined as two or less unused spaces. Officially, *MV 'Hendra'* is meant to accommodate 14 standard-sized vehicles whilst *MV 'Linga'* is meant to accommodate 16 standard-sized vehicles. Unused capacity is an estimate of the number of cars that *could* fit on the ferry. The amount of unused space on a ferry depends on the size of the vehicles on the ferry.

Statutory Context

3 Statutory Context

3.1 Introduction

The aim of this Chapter is to set out the national and local planning policy context within which this study is set.

ZetTrans' Regional Transport Strategy sets the regional and local policy context for this study.

At the national level, consideration has been taken of the National Transport Strategy published in 2006, as well as the national planning guidelines including Scottish Planning Policy 17: Planning for Transport, and Scottish Planning Policy 15, which focuses more specifically on measures to promote sustainable rural development.

At the local level, focus has centred on how this study fits with policies and principles adopted within the key Shetland specific policy documents such as the Shetland Islands Structure Plan and the Shetland Local Plan. In addition, the Economic Development Plan, 'Shetland 2012', and the Corporate Plan have been reviewed in order to highlight the links between the objectives of the Whalsay Transport Link project and the wider objectives fostered by Shetland Islands Council and other Shetland bodies.

3.2 National Planning and Policy Framework

The national policy framework for transport is set out in the National Transport Strategy (2006). Relevant Planning advice is contained in SPP 17: Planning for Transport, and PPG15: Planning for Rural Development.

3.2.1 National Transport Strategy (2006)

In December 2006, the Scottish Executive[15] published Scotland's National Transport Strategy (NTS) outlining the long term vision for transport, together with its objectives, priorities and plans. The NTS focuses on three strategic outcomes which will set the context for transport policy making for the next twenty years:

- improve journey times and connections between our cities and towns and our global markets to tackle congestion and provide access to key markets;
- reduce emissions to tackle climate change; and
- improve quality, accessibility and affordability of transport, to give people the choice of public transport and real alternatives to the car.

The following national transport objectives, published in the 2004 White Paper *Scotland's Transport Future*, have been retained in the NTS:

- To promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency;
- To promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network;
- To protect our environment and improve health by building and investing in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy;
- To improve safety of journeys by reducing accidents and enhancing the personal safety of pedestrians, drivers, passengers and staff; and
- To improve integration by making journey planning and ticketing easier and working to ensure smooth connection between different forms of transport.

[15] Now Scottish Government.

Particular initiatives included in the National Transport Strategy relevant to Shetland are:

- a commitment to a national concessionary travel scheme for young people, and continuation of schemes for older and disabled people;
- support for lifeline airports and air services;
- a review of ferry services, with a view to developing a long-term strategy for lifeline services to 2025;
- review of the affordability of public transport in relation to ferry services;
- support for the Air Discount Scheme;
- expanded funding for Demand Responsive Transport services; and
- encouragement for more sustainable travel patterns.

3.2.2 *National Performance Framework*

Since publication of the NTS, the Scottish Government has set out five new Strategic Objectives[16] that apply across all aspects of society, as well as transport. These objectives are that Scotland should be:

- Wealthier and Fairer;
- Healthier;
- Safer and Stronger;
- Smarter; and
- Greener.

Fifteen new National Outcomes[17] have also been set out by the Scottish Government.

As part of the Single Outcome Agreement (SOA) Settlement, the Scottish Government called on all Local Authorities to develop a list of Local Outcomes and Indicators to demonstrate how each Council will contribute to the delivery of the five new Strategic Objectives and fifteen National Outcomes. In April 2008, Shetland Islands Council approved its SOA, setting out its Local Outcomes and containing the list of Local Outcome Indicators which the Council will monitor to measure its progress in delivering these new Strategic Objectives and National Outcomes. Those Local Outcome Indicators that this Study has the potential to influence are as follows:

- LI 1: Increase the availability, accessibility and usage of internal public transport; and
- NI 36: Increase the proportion of journeys to work made by public or active transport.

3.2.3 *Scottish Planning Policy SPP17 – Planning for Transport*

The aim of this planning guidance is to develop the integrated land use and transport planning elements proposed in the White Paper policy package.

As with all SPPs, SPP17 is underpinned by the sustainable development principles of economic competitiveness, social justice, environmental quality and design. Working towards this, SPP17 has the following objectives:

- to meet European and UK commitments and targets on greenhouse gas and local air quality;
- to maintain and enhance the natural and built environment, through avoiding or mitigating adverse environmental impacts, minimising
- environmental intrusion and retaining, improving and enhancing areas for biodiversity;
- to maintain and enhance the quality of urban life, particularly the vitality and viability of urban centres;
- to reinforce the rural economy and way of life; and
- to ensure that the impact of development proposals on transport networks does not compromise their safety or efficiency.

In reference to rural, remote and island communities, one of the policy aims of SPP17 is “to have a prosperous rural economy, with a stable or increasing population where rural communities have reasonable access to good quality services.”

[16] http://www.scotland.gov.uk/About/purposestratobjs
[17] http://www.scotland.gov.uk/Publications/2007/11/13092240/9

3.2.4 *Scottish Planning Policy SPP 15 - Planning for Rural Development*

This guideline states that the clear goal for Scotland's rural areas, including islands, should be to maintain the viability of existing communities and bring new life into places which have seen years of decline.

SPP 15 also recognises that Scotland's rural areas are "unique resources" and future life-style changes and technological advancements could increase the demand for living and working in rural areas. Consequently, it is advised that planning authorities are proactive in releasing rural land for development.

This guideline also supports the main message put forward in the Scottish Executive's 'Rural Scotland – A New Approach' publication (May 2000). The overarching aim of this strategy is "to have a prosperous rural economy, with a stable or increasing population that is more balanced in terms of age structure and where rural communities have reasonable access to good quality services". It is recommended that planning supports this aim by allowing development where good infrastructure capacity and accessibility exists, or where it can be provided at reasonable cost or to meet justifiable social and economic costs.

SPP 15 also notes the importance of retaining younger community members in rural areas and suggests that planning should support economic opportunities, particularly those that seek environmental enhancement, such as the aquaculture industry. The important role that planning authorities can play in the development of the tourism industry in rural areas is also stressed within SPP 15.

Finally, SPP 15 highlights the importance of considering local circumstances and treating each development case individually according to its 'appropriateness' in terms of scale, location, design and transport provision.

3.3 Local Planning and Policy Context

This section examines the planning and policy framework for the study area in relation to transport, in the local context. The local context is set out within Shetland's Regional Transport Strategy (RTS) and the Shetland Islands Council's Structure and Local Plans. Reference is also made to some of the key policies outlined in 'Shetland 2012', which details the economic development strategy for the islands. A brief summary of the key objectives arising from these documents is provided below.

3.3.1 *Regional Transport Strategy*

ZetTrans finalised and approved the updated RTS for submission to Scottish Ministers in April 2008. The vision of the strategy is:

"To develop an effective, efficient, safe and reliable transport system for Shetland. The transport system will comprise an integrated network of accessible, and affordable internal, inter-island and external links, which will contribute to the development of a safe, healthy, vibrant and inclusive society, a diverse, successful and self-sufficient economy, and enhanced environmental quality."

Contributing to this overarching vision for Shetland, the RTS sets out objectives under the five headings of: Economy, Safety, Environment, Accessibility and Social Inclusion, and Integration. These objectives align with and support the five national objectives for transport. With a view to the context of Shetland, the RTS sets out a series of sub-objectives, summarised in Table 3.1.

Table 3.1: ZetTrans' RTS sub-objectives

Economic objective	ECON 1	Work to ensure ongoing reliability of Shetland's transport networks.
	ECON 2	Work to ensure that external and inter-island ferry and air links are affordable to all (passengers, livestock and freight).
	ECON 3	Work to improve the robustness of the transport system (public and private) against significant potential increases in fuel prices.
	ECON 4	Support measures that efficiently address current and anticipated capacity constraints on the islands' transport links.
	ECON 5	Deliver a transport system that is economically efficient, maximising the overall benefits across each of the five main objectives for a given sum of investment.
	ECON 6	Work to optimise the wider economic benefits of the external links for Shetland.
	ECON 7	Work to achieve beneficial service development and market growth on Shetland's public transport networks.
Accessibility and Social Inclusion objective	SIA 1	Support the retention of measures to ensure continued operation and availability of external, inter-island and internal lifeline freight, livestock and passenger services and infrastructure to specified service levels.
	SIA 2	Support measures to ensure access for all on the transport network.
	SIA 3	Seek to ensure that the timings and frequency of internal and external passenger services take account of specific requirements of those accessing essential health and welfare services in Shetland and on the Scottish Mainland.
	SIA 4	Maximise accessibility (frequency, operating day, service delivery options) to and from each community within constraints of funding, demand, technical and operational feasibility, and taking account of convenient access to essential services, and the social and economic well-being of the community.
	SIA 5	Work to improve accessibility for vulnerable groups to essential services.
Environmental objective	ENV 1	Reduce carbon dioxide and greenhouse gas emissions, and the consumption of non-renewable resources arising from transport, travel and infrastructure in control of ZetTrans, SIC and its partners.
	ENV 2	Encourage and facilitate reductions in carbon dioxide and greenhouse gas emissions, and the consumption of non-renewable resources arising from transport and travel in control of private users and other operators.
	ENV 3	Encourage and facilitate walking and cycling for short trips.
	ENV 4	Minimise impacts of transport and associated infrastructure on the terrestrial and water environments.
	ENV 5	Reduce impacts of transport services and new transport infrastructure on landscape, the historic environment and biodiversity.
	ENV 6	Support species native to Shetland through the roadside Biodiversity Action Plan and appropriate management and maintenance of road network.
	ENV 7	Encourage design of transport infrastructure that is appropriate to Shetland.
	ENV 8	Seek to minimise the adverse affects on natural drainage systems from roads run-off.
	ENV 9	Seek to reduce the vulnerability of transport / infrastructure to climate change.

Safety objective	SAFE 1	Ensure compliance with internal and external safety and security requirements.
	SAFE 2	Implement measures that seek to achieve National Road Safety Targets.
	SAFE 3	Encourage the elimination of driving under the influence of alcohol or drugs.
	SAFE 4	Encourage improvement in seat belt compliance and new legislation with regard to the use of mobile 'phones.
	SAFE 5	Implement measures to reduce fatalities, addressing particular concerns relating to single vehicle accidents.
	SAFE 6	Discourage excessive and inappropriate vehicle speeds.
Integration objective	INT 1	Deliver effective and integrated public transport links to and from Shetland's principal passenger transport interchanges at Sumburgh Airport and Holmsgarth Ferry Terminal, with the inter-island ferry service terminals, and the inter-island air service.
	INT 2	Deliver effective transport integration opportunities and facilities at Shetland's principal passenger transport interchanges at Sumburgh Airport and Holmsgarth Ferry Terminal, and at Shetland's principal public transport hubs within Lerwick.
	INT 3	In partnership with other Regional Transport Partnerships, encourage effective transport integration opportunities at Shetland's principal UK Mainland ferry terminals and airports.
	INT 4	Maintain integrated freight facilities at each relevant ferry terminal.
	INT 5	Deliver integrated and multi-modal ticketing across Shetland's public transport network.
	INT 6	Provide effective journey planning information for visitors and residents for trips within, to and from Shetland.

The RTS recognises 'the fundamental role played by the inter-islands ferry services in contributing to sustaining social and economic opportunities on each island.' The RTS also recognises the high costs associated with maintaining inter-island links, but also states that secure, reliable and compliant links are essential elements for the Transport Strategy.

With regard to Whalsay, the RTS indicates that whilst the inter-island link between Whalsay and the Mainland is important, ZetTrans are capable of funding only ongoing maintenance and repair of the existing service and that this would "This would fail to address current needs, lead to a deterioration in services and would be likely to increase problems in the future". The RTS indicates support, in principle, for the development of a fixed link to Whalsay, but ranks the link as fourth in priority in terms of the development of inter-island fixed links within Shetland.

3.3.2 *Structure Plan*

The Shetland Islands Structure Plan (2000) focuses on shaping a more sustainable Shetland and sets out a series of 'top goals' to help achieve this. With regards to the topic of transport, the Structure Plan states that its top goal is "to deliver an integrated transport system that meets the needs of Shetland people and seeks to minimise impact on the environment."

With more specific reference to ports, harbours, ferry terminals and bridges, the Structure Plan states that these play a vital role in the economy of Shetland. For example, it is stated that ports and harbours offer opportunities for further growth and should be safeguarded against inappropriate development. At the same time, however, the Structure Plan recommends that 'port related development should not be constrained by the inappropriate use of land immediately adjacent to port areas'.

3.3.3 *Shetland Local Plan (2004)*

According to Shetland's Local Plan, it is important that the character of Shetland's coast is protected from inappropriate development and that development which requires a coastal location is directed in the first instance to areas where development has taken place. Globally it is likely that sea levels will rise significantly over the next hundred years and that storms will become more severe. Around Shetland a sea level rise of 0.8 to 0.9 metres (3 feet) is predicted. This will have consequences for all existing and proposed coastal development. Great care will be taken to ensure development proposals will not increase the likelihood of erosion or tidal inundation. The aim of this policy is to protect the coastline from inappropriate development, balancing the needs of industry and the environment, while recognising the importance of the coast in the day-to-day life and economic prosperity of Shetland.

The Local Plan also notes that Shetland's traditional industries such as fishing, agriculture and knitwear are vulnerable to external influences such as the cost of fuel and transport, climate change, increasing regulation and the rapid development of the global economy. If Shetland's rural communities are to prosper then they must be able to develop, and attract and sustain new economic activities. The challenge lies in ensuring that these new activities do not destroy the environment on which they depend.

Generating and promoting new jobs in existing rural communities embraces the principles of sustainability, reducing the need to travel and maintaining the viability of local services and infrastructure. The policies in this chapter of the Local Plan hope to achieve this, by encouraging industry to locate in existing settlements where sufficient infrastructure is present, potential employees are nearby and the impact on the environment is minimised.

The top goal of the Local Plan in relation to Shetland's transport network is to deliver an integrated transport system that meets the needs of Shetland's people and seeks to minimise impact on the environment. With reference to the transport system on Whalsay the Local Plan recognises that frequent and affordable ferry links to the Mainland are vital for the social and economic well being of the community.

3.3.4 *Economic Development Strategy*

Shetland 2012 is the latest economic development strategy for the Shetland Islands and aims 'to ensure that Shetland has access to transport and communication links that are of a high quality and support economic and community development'.

The Strategy seeks to deliver this aim through a range of strategies that will attempt to improve the islands communication links with the outside world, including measures to improve external air and ferry links into the islands and through the implementation of high quality electronic communications links and IT, which will increase the connectivity of Shetland Islands and improve its links to the global economy.

Shetland 2012 also adopts a local view and aims 'to foster sufficient economic activity in the remoter parts of Shetland to ensure that rural communities remain and/or become places where people can live and work with good career prospects'.

3.3.5 *Corporate Plan 2008 – 2011*

The vision for Shetland as described in the Corporate Plan is "We will seek to improve the quality of life in Shetland by promoting an economy where traditional industries thrive and innovate alongside newer, emerging industries. We will seek to focus economic development activity and investment on projects that will maximise income through the production of high quality produce aimed at discriminating consumers. For these ambitions to be sustainable, they must be achieved in ways that protect or enhance Shetland's environment and strengthen Shetland's society."

To achieve this vision, the Corporate Plan aims to:

- Link all economic development activity to market needs;
- Encourage enterprise and sustainable economic growth;
- Expand knowledge and build skills;
- Improve access and extend opportunities; and
- Focus on quality.

The Corporate Plan sets out a suite of long-term targets with regard to population, housing and employment opportunities, minimised environmental impacts and with regard to improving the quality of life for residents of Shetland.

The Corporate Plan recognises that because Shetland is geographically remote from its markets, it will be vital to improve Shetland's communication links to help competitiveness. In addition to the improvement of sea and air travel to assist in this aim, the plan also highlights the importance of ensuring that Shetland is connected to the UK by high quality electronic communications.

In addition to external links, the Council also discusses the importance of improving internal transport links within its Corporate Plan. For example, it is stated that Shetland is a scattered community and it is important to provide a sustainable and easy to use system for transporting freight and people. The Corporate Plan sets out an action plan in order to help *"Develop an environment in which the travel needs and priorities of Shetland's communities can be thoroughly researched and understood, enabling effective planning appraisal, prioritisation, integration and delivery of transport services and infrastructure."*

3.4 Summary

This Chapter has outlined the national and local planning policy context for the study area. The key points emerging from the policy review for the study are that national, local and transport policies all emphasise the importance of efforts to sustain island communities, and accept that local and central funding will be central to the sustaining of these, often isolated, populations. There is a strong national, regional and local context for the inter island ferry service.

On a national level, there is a policy commitment to lifeline ferry links and to support the development of improved services and maintenance of affordable fares and introduction of new vessels and routes. Additionally, there is an overarching aim to have a prosperous rural economy with a stable or increasing population.

On a regional level, there is recognition that ZetTrans is only capable of funding ongoing maintenance and repair of the existing Whalsay service and that this would fail to address current needs and would be likely to lead to an increase in problems in the future.

Local level policies recognise that frequent and affordable ferry links to the Mainland are vital for the social and economic well-being of the community.

The following Chapter will provide a review of the consultation undertaken for the study.

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Analysis of Existing and Potential Problems

4 Analysis of Existing and Potential Problems

4.1 Introduction

The existing transport link between Whalsay and the Mainland was analysed to uncover any existing and potential problems and opportunities. The analysis included extensive consultations with stakeholders. This Chapter provides a review of the key problems and opportunities related to the study. Many of the problems and opportunities are inter-related.

4.2 Planning for the Replacement of Existing Vessels

MV *'Linga'* and MV *'Hendra'* are the vessels currently assigned to the route. Whilst MV *'Linga'* has an assumed twenty-five-year design life to 2027, refurbishment work has been recently undertaken to MV *'Hendra'* to extend her life to 2014.

A profile of the vessels within the Shetland fleet, currently suitable for use on the Whalsay route is provided in Table 4.1 below. Of these vessels, two are required for fleet relief purposes (currently MV *'Bigga'* and MV *'Thora'*), with MV *'Geira'* to be used to support MV *'Fivla'* on the Bluemull Sound services. Other vessels in the fleet are either non roll-on roll-off, are specifically designed for the requirements of a particular route, or would require enlarged terminal and linkspans.

Table 4.1 – Current and Previous Vessels Potentially Suitable for Symbister – Laxo Route

Vessel	Vehicle Capacity (PCUs)	Passenger Capacity	Year of Construction	Current Age
MV Bigga	16	95	1991	17
MV Fivla	11	95	1985	23
MV Geira	11	86	1988	20
MV Hendra*	14	95	1982	26
MV Linga*	16	95	2002	6
MV Thora	11	92	1975	33

* Currently in regular service on the Symbister – Laxo route

Nominal economic life expectancies for vessels are twenty five years. It can be seen that MV *'Hendra'*, MV *'Fivla'*, MV *'Geira'* and MV *'Bigga'* will shortly reach or pass this milestone, whilst MV *'Thora'* is currently significantly beyond this age. MV *'Hendra'* recently had work undertaken to extend her life to 2014.

Present EU Directives require that MV *'Hendra'*, and other similar aged vessels, be modified to match EU requirements by a certain date (July 2010 for *'Hendra'* and Thora, a year later for the others). At present there is a UK Merchant Shipping Notice (MSN) which indicates that the UK believes that existing regulations give "equivalent" safety to the EU Directive. However, this interpretation is unlikely to be accepted outwith the UK.

Modifications to *'Hendra'* etc are not practicable so SIC cannot adhere to the EU Directive. Therefore we are reliant upon the UK MSN to allow the vessels to continue in service. This MSN is not backed by specific legislation and can, therefore, be withdrawn at any time. Clearly other operators are in a similar situation to us so there will be pressure to either retain the MSN or to give a long lead time before it is withdrawn. However there is no certainty such pleas would be listened to.

Accordingly, there is a relatively urgent requirement to plan for the replacement of those vessels that can be used on the route.

4.3 Changing Vessel Legislation

It is highlighted that a like-for-like replacement of existing vessels could not necessarily be achieved under current legislation. This is principally due to new safety features required by recent legislation[18], for example stability requirements, and the requirement for passenger accommodation to be above the water line. In combination, these factors result in a larger sized vessel just to carry a similar number of vehicles. This has implications for the future renewal and replacement of the ferry terminals.

4.4 Renewal and Replacement of Ferry Terminals

The current ferry terminals at Laxo, Vidlin and Symbister Harbour, designed for the first generation of ferries in the 1970s, are now at the limits of their operation due to the increased size of vessels utilising them and consequential increased berthing pressures.

Structural surveys of all three terminals, undertaken in the mid 1990's[19] (i.e. prior to the introduction of MV *Linga*) raised concerns about the increases in size of vessels berthing at the terminals, with corresponding increased berthing pressures, and also the increased frequency of berthing. The reports for Laxo and Vidlin highlighted that "*it would be impractical to use the existing terminal for larger ferries than those currently on the route. Current use is loading the structure to and beyond its limit."*

It is clearly necessary to plan for the renewal of terminals and vessels in a co-ordinated manner. The introduction of terminals capable of accommodating the largest vessels within the fleet (MV *Daggri* and MV *Dagalien,* currently deployed to Yell Sound*)* would provide wider network benefits, allowing flexible deployment of these vessels to Whalsay in cases of service disruption. In the case of either linkspan failure or maintenance at Toft (Mainland terminal for the Yell Sound service), a larger terminal at Laxo and/or Vidlin would allow the continuation of service to Yell, Unst and Fetlar.

4.5 Managing Vehicle Demand

The key issue relates to the requirement to address high demand for vehicle deck space on those sailings most suitable for commuters, leaving Whalsay in the morning, and departing from Laxo in the evening.

A review of historic, current, and future vessel carryings is provided in Appendix B. Analysis of vessel carryings on the route between 2000 and 2005 reveal large increases in demand for vehicle deck space on those sailings most suitable for commuters.

4.5.1 Current Trends

Over the past number of years, the numbers of passengers and vehicles have been increasing. Table 4.2 summarises the trends for the years 2000 to 2005.

[18] Principally EU 2002/25/EC and EU 1998/18/EC (also known as L144) – Safety Rules and Standards for Passenger Ships (EU Class B domestic ferry).

[19] Shetland Islands Council, Department of Design and Technical Services produced structural surveys of Symbister, Laxo and Vidlin Ferry terminals in April 1995.

Table 4.2: Patronage on the Symbister – Laxo route

	Sailings	Passengers	Passenger Car Units	Vehicle Deck Utilisation
2000	12303	145882	71807	46%
2001	12373	138022	68998	44%
2002	10692	130512	66242	46%
2003	12312	153828	77491	48%
2004	12358	157375	80076	50%
2005	12193	166016	83589	48%
Average annual % change 2000-2005	0.00	2.97	3.35	-

*2006 data is available but due to changes in the log book keeping there are concerns about the robustness of this data and it has been considered inappropriate to compare it with preceding years. It does however suggest continued increased in patronage numbers;
**2007 data was not available in a complete data set at the time of writing

Taking all commuter sailings together and comparing them against all other sailings for the 2000 to 2004 period shows the following changes in passenger and vehicle activity. (Commuter sailings are defined as the 0630, 0710, 0750 and 0825 sailings ex Symbister and the 1700, 1745, 1830 and 2030 ex Laxo).

Table 4.3 – Changes in Activity - Commuter and Other Sailings

Passengers	**2000**	**2004**	**Change**	**% change**
Commuter sailings	37101	41595	4494	12.1
All other sailings	108781	115780	6999	6.4
All sailings	145882	157375	11493	7.9
PCU's	**2000**	**2004**	**Change**	**% change**
Commuter sailings	15089	19864	4775	31.6
All other sailings	56718	60213	3495	6.2
All sailings	71807	80007	8200	11.5

The figures show year on year growth of 2.8% per annum (compounded) for commuter sailing passengers and 7% per annum (compounded) for their vehicles suggesting an increasing preference amongst commuters to travel by car. Furthermore, the 2004 commuter sailings vehicle deck utilisation figures show an average of 69.1% across the year. This compares with 58.0% in 2000. The high utilisation figure, combined with the very narrow window for travel which the majority of commuters have, along with the number of customers who already find it impossible to travel with their car, suggests that capacity constraints are already having an impact on the ability of commuters to travel with their vehicle.

Census data suggests that the historic response to a down turn in activity on Whalsay (e.g. reduction in White Fish fleet) has not necessarily led to a reduction in island population, which has remained particularly stable. A static population on the island with an ever-growing commuter base confirms the islanders' wish to stay on Whalsay and to travel to the Mainland for work, domestic and leisure purposes. This suggests that any change in the fortunes of the fish-processing factory could well be an increase in commuting, rather than de-population of the island. The lack of any restrictions on the availability of land on Whalsay for the construction of dwelling houses (which has seen year on year increase), added to a perceived desirability of Whalsay as a place to reside, suggests that the island will retain its population base or will see it increase. Either way, the ever-increasing commuter demand looks set to continue.

A further pressure for vehicle deck space has arisen due to historical growth in the average size of cars, which over time tends to effectively reduce the average vehicle carrying capacity of a vessel.

4.5.2 *Passenger Growth (unconstrained)*

Using the 2000 to 2004 period as a basis for the forecast, and considering the long period of sustained growth on the route, it is estimated that passenger growth will continue at 1.9% per annum. If the fish processing plant closes during the period of this forecast (25 years), it is likely there will be an initial step-wise increase in the number of commuters that will be sustained through the duration of the forecast period. The likely increase has not been estimated at this stage. Likewise, if the plant increases in size, there will be a one off increase in the number of Mainland-based commuters travelling.

The overall low levels of passenger activity, when compared with the available passenger capacity on the route, will not be constrained by the lack of available space.

4.5.3 *Vehicle Growth (unconstrained)*

Based on 2000 to 2006 and considering the longer-term growth, it is estimated that net vehicle growth will continue at the 2.8% per annum level. The forecast growth in the number of vehicles wishing to travel will place considerable strain on the already heavily utilised vehicle decks especially at commuting times.

4.6 Management of Heavy Goods Vehicles

A current problem related to the design of the existing vessels relates to the capacity to carry Heavy Goods Vehicles. MV Linga, due to the requirement to place passenger accommodation above the vehicle deck, has restricted capacity for carrying high vehicles. This can restrict the ability of the vessel to carry such vehicles in a flexible manner. Due to competition for space on the vehicle deck of the smaller vessels, there can also be lengthy delays for larger vehicles until space is available on the ferry to make a crossing. This most affects construction related vehicles, rather than regular users who are able to block book space on the ferries.

4.7 Sustaining the Socio-Economic Prospects of Whalsay

Research has indicated the key role that frequent ferry services can have on the economic and social prospects for island communities.[20] Economically, it is known that frequent and accessible ferry services can bring benefits to local producers and retailers, and local hauliers and transport providers. A good ferry service is also a prerequisite for any growth in tourism activity. However, there are wider social benefits. This can include community confidence, increased levels of social interaction between groups on and off the island, improved access to services including health and training, as well as changes in perception of inclusion.

The current ferry service has helped to enable the maintenance of Whalsay's population, which has remained stable, despite economic set backs such as the decline in the white fish sector. Laxo is just over half an hour's drive from Lerwick, and given the good quality of roads, is considered to be quite accessible for commuters who can live on the island and work on the Mainland. Given a potentially uncertain future for the local fish-processing factory, further increases in commuting from the island may be expected.

As well as ensuring continued provision of a frequent ferry service that provides good access to the Mainland, the community is concerned that any future fare levels do not threaten the welfare of the island. Clearly, the ability to make frequent trips to and from the island is important for the community, both for work, but also for access to shopping, educational, leisure and social opportunities. There is a concern that if this ability was constrained in any way by fare increases, over and above the rate of inflation, the welfare of the island would suffer.

A third issue is to ensure that future developments related to the ferry service, and wider harbour do not compromise, but potentially enhance, the operation of other economic activities on the island. This specifically relates to maximising, or at least maintaining, economic opportunities within the harbour itself, which is seen as the "heart" of Whalsay, given the historic and current importance of fishing related activities to the local economy.

[20] For example, Grangeston Economics, *Evaluation of the Social and Environmental Impact of the Sound of Harris Ferry Service,* 2003, prepared for Highlands and Islands Enterprise and Western Isles Enterprise.

4.8 Harbour Congestion Issues

The existing marina is sited very close to the existing ferry terminal. Whilst ferries can currently safely manoeuvre within this space, there is little margin for error, and difficulties can be experienced in high winds, and in rare instances of mechanical failure. This has allegedly caused damage to both ferries and marina users.

There can also be competition for space within the inner pier. Whilst three ferries are typically moored overnight at Symbister, occasionally relief vessels are also berthed at the harbour, and this can reduce berthing space for other vessels using the inner harbour area.

Moreover, during summer months, consultation with ferry crews explained that there were sometimes difficulties safely navigating at the harbour mouth, and within the harbour, due to large numbers of leisure users.

It is considered that the introduction of larger ferries would introduce further difficulties for safe operation within the inner harbour area.

4.9 Affordability

A particular problem with maintaining continued high levels of access to the island relates to the high operational costs that are incurred, and also the significant investment required in new ferries, and larger terminals, in order to maintain current service levels.

The consultation raised fears that the operation of two larger ferries, due to increased running costs, and leasing costs (if vessels are financed in this manner) could ultimately be considered to be financially unsustainable – ultimately leading to the provision a single vessel service for the island, and a consequential reduction in accessibility. This has led to requests for the development of replacement vessels to be practical, simple, affordable and suitable for the intended route. It is noted that SIC has struggled to maintain a balanced revenue budget over recent years. Currently, SIC receive Grant Aided Expenditure (GAE) of which a small proportion is allocated to ferry services. The GAE currently supports the Laxo-Symbister service to a significant level of approximately 50% to 55%.

Furthermore, there is concern about the large capital investment required to secure the continued provision of the current ferry service. The Council's current capital plan does not specifically include for investment in the route, and external funding may be required to support investment by the Council. This would most likely be sought from the Scottish Government, who would require a robust case for investment on the route.

4.10 Operational Reliability

The importance of securing the provision of an operationally reliable link to the island was stressed, including a link that can operate satisfactorily during periods of poor weather, and also continue service during both scheduled and unscheduled service alterations.

With respect to ferries, greater operational reliability can be achieved through greater standardisation within the fleet and with terminals. This can allow a flexible deployment of vessels to cope during periods of planned vessel and linkspan maintenance, and facilitate efficient relief services during periods of unscheduled vessel or linkspan maintenance.

Other benefits of achieving a greater standardisation with the fleet have been presented, including potential cost efficiencies in operation due to standardisation of training requirements, and efficiencies in routine maintenance.

4.11 Day to Day Operational Issues

Other problems were raised, typically related to the day-to-day operation of the ferry services. They are not necessarily related to the provision of new ferries or terminals, but are important considerations for the future planning of the service.

- Vehicles booked onto ferries not actually utilising their booking as planned, thus needlessly increasing the amount of vehicles waiting on stand-by.
- Ability to make bookings, or cancel bookings, outwith booking office opening times.

- Gaps in the timetable can cause difficulties. The potential for an earlier sailing to enable islanders to catch the first scheduled flight from Sumburgh was highlighted.
- Reliability concerns with MV *'Linga'.*
- Some difficulties with the smaller of the two vessels currently undertaking the 17.50 sailing from Laxo.
- The costs of the ferry service for passengers and vehicles was frequently mentioned as a constraint on accessibility to the Mainland. However, others also recognised that ferry fares did not overly constrain travel opportunities. The requirement for fares not to increase above the levels of inflation was highlighted, so as not to damage the socio-economic prospects of the island.

4.12 Summary

In summary, this Chapter has addressed the range of problems and opportunities that have been uncovered in this study.

Focus has concentrated primarily on vehicle capacity problems aboard the ferries as well as problems related to the booking system and service gaps. Related to the capacity problem on the ferry, there is an issue with the restricted capacity for HGVs and high vehicles on MV *'Linga'*. Due to competition for space the vehicle deck, there can be lengthy delays for larger vehicles.

Other identified problems relate to aging vessels, changing legislation with regard to ferry design standards, and marine congestion in Symbister Harbour.

The ferry terminals were identified in terms of the increasing berthing pressures and increasing rate of wear and tear on the terminal infrastructure.

Stakeholders have expressed concern regarding affordability, both in terms of fares as well as the importance of finding an affordable solution for funding bodies. There were also concerns expressed over the operational reliability of the ferries with regard to operation in inclement weather as well as continuation of service during times of repair and routine maintenance.

The following Chapter explores the objectives to address each of the existing and potential problems identified in this chapter.

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Objectives

5 Objectives

5.1 Introduction

The six objectives identified for this study were identified during the STAG Part 1 appraisal and further refined as part of the STAG Part 2 process. The specific project objectives have been derived from stakeholder consultation work conducted as part of the STAG Part 1 phase, and from a range of national and local policies and strategies. The objectives were developed with a view to marrying stakeholder identified issues and aspirations with relevant policies and development plans.

Objectives identified in STAG Part 1 are six-fold:

- To deliver a solution that is affordable (for funding bodies);
- To deliver a solution that is operationally sustainable;
- To at least maintain the current level of accessibility to the island;
- To reduce conflict between ferry and other harbour users;
- To better match supply and demand; and
- To ensure that the socio-economic characteristics of the island are not constrained.

5.2 SMART Objectives

STAG guidance requires that objectives are SMART – specific, measurable, achievable, relevant and time-related. Taking these objectives forward and refined to be SMART, objectives for STAG Part 2 are:

- To deliver a solution that is affordable (for funding bodies); involving:
  - full funding for the preferred option secured within 2 years by 2010, with applications for funding to be submitted to the Scottish Government, EU funding agencies, SIC and other opportunities among other funding agencies. It is recognised that full funding will likely be required from a number of grant agencies and organisations.
  - Secured and approved SIC revenue funding for operation and maintenance of the transport link for the next 30 years by 2009 with indication of availability of long-term revenue funding from SIC by 2009.

- To deliver a solution that is operationally sustainable, involving;
  - No more than 1.7% of journeys cancelled due to inclement weather;
  - Integration of ferry vessels and infrastructure with infrastructure elsewhere on Shetland Islands in order to minimise service disruptions during scheduled maintenance
  - Minimised disruption in service between Whalsay and the Mainland during development and construction of the new transport link
  - A solution that is realistically capable of being delivered before expiration of existing ferry vessels and infrastructure (i.e. a new transport link in place by January 2014).

- To at least maintain the current level of accessibility to the island; including:
  - a minimum of 36 sailings retained per day on weekdays (Monday through Saturday); including 34 scheduled sailings and two additional evening sailings if booked in advance; and
  - a minimum of 26 scheduled sailings on Sundays, with two additional evening sailings if the ferry is booked in advanced

- To reduce conflict between ferry and other harbour users, including:
  - marine accident rate within Symbister Harbour at 0 per year.

- To better match supply and demand, including:
  - vehicle deck utilisation rate not to exceed 90% on peak sailings by 2014;
  - no vehicles left behind on 99% of all sailings, by 2014.

- To ensure that the socio-economic characteristics of the island are not constrained in the short-, and medium-term (to 2023); including:
  - the number of job opportunities maintained or increased based on 2007 levels
  - the number of residents on Whalsay maintained or increased based on 2007 levels
  - the number of businesses or commercial enterprises maintained or increased based on 2007 levels
  - the number of fishing vessels maintained or increased based on 2007 levels

5.3 Matching Objectives with Existing and Potential Problems

To ensure the robustness of the objectives, each the problems identified in Chapter 4 were cross-checked with each of the identified objectives. Table 5.1 shows that each identified problem is matched with an objective. Similarly, each objective addresses one or more identified problems.

Table 5.1 Problems and Objectives Matrix

Existing and Potential Problems	Objectives					
	To deliver a solution that is affordable (for funding bodies)	To deliver a solution that is operationally sustainable	To at least maintain the current level of accessibility to the island	To reduce conflict between ferry and other harbour	To better match supply and demand	To ensure that the socio-economic characteristics of the island are not constrained in the short-, and medium-term (to 2023);
Planning for the replacement of existing vessels		✓	✓			
Changing vessel legislation		✓	✓			
Renewal and replacement of ferry terminals		✓	✓			
Managing vehicle demand					✓	✓
Management of Heavy Goods Vehicles					✓	
Sustaining socio-economic prospects of Whalsay						✓
Symbister Harbour congestion issues				✓		
Affordability	✓					
Operational reliability		✓				
Day to day operational issues		✓				

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Option Generation and Sifting

6 Option Generation and Sifting

6.1 Option Development

This Chapter describes the development of a long list of options for consideration in the Whalsay study. It quickly sieves out options which are considered to be unfeasible from the outset.

6.2 Option Generation and Sifting

This section will discuss and define the options generated and considered for the appraisal process and will provide a summary of those options which were taken forward for further appraisal.

The options were developed to provide a broad range of alternative ways to address the project aims and objectives.

6.3 Options for Whalsay Terminal Location and Configuration

A number of options have been considered for the location of the terminal on Whalsay. These options are summarised below.

- Retain ferry terminal within existing Symbister Harbour and relocate elements of existing harbour activity elsewhere on Shetland.

This option focussed on the potential of relocating existing vessels from Symbister Harbour to other harbours in Shetland, including Lerwick. This could provide space for a relocated ferry terminal within Symbister Harbour, and reduce conflict with other harbour users.

It was found that there was little benefit in moving the marina, as this occupied space within the harbour that was too shallow for use by other craft. Furthermore, the marina depends upon local access to the facility.

It would not be beneficial to relocate the ferries from Whalsay, as currently ferry staff are “island-based” and provide a 24 hour emergency call out service for the island.

Whilst the relocation of the smaller fishing vessels could in theory be achieved, this would attract additional costs for these businesses, and remove the benefits of having the vessels serviced, and provisions purchased, on Whalsay.

For the larger fishing vessels in the pelagic fleet, which mainly lay-over at Whalsay, the limited number of alternative suitable berths elsewhere in Shetland restricts the suitability of this proposal. Furthermore, as the vessels are owned and crewed by Whalsay residents, the local lay-over of vessels provides an option that is attractive and convenient. A wholesale removal of the larger vessels is therefore not considered desirable.

This option has not been considered further

- Retain terminal in existing Symbister Harbour by extending the harbour inland to create more space within the harbour.

This measure involves further dredging works in the inner harbour, and in the area currently used by the marina. An inward extension would be constructed to provide more room in the harbour. The ferry terminal would be upgraded or replaced in order to accommodate larger-sized ferry vessels.

This option has been retained for further consideration

- Retain terminal in existing Symbister Harbour by extending harbour outwards.

An option to extend the current harbour, by constructing an outer breakwater, and re-aligning/widening the current harbour entrance was developed. This option would provide the opportunity for a new ferry terminal to be constructed within this existing breakwater, and consequently provide more room within the inner harbour area. The option involves considerable risk and cost associated with water depth.

This option has been retained for further consideration

- Retain existing harbour plus new facility at North Voe for either marina, ferries or fishing vessels.

This proposal involves relocating one of the existing harbour users out of Symbister Harbour to a new facility developed at North Voe. In terms of achieving the planning objectives, it is considered that the best opportunity would come from the relocation of the ferry terminal. This would remove all conflict between the ferry and other harbour users. By contrast, relocation of the fishing vessels to North Voe would take them away from the existing shore-side facilities. Relocation of the marina would still maintain the current operational difficulties within the inner harbour.

This option has been retained for further consideration

- Retain existing harbour plus new facility elsewhere on Whalsay.

If a Mainland terminal was to be sited in a location other than Laxo, then an alternative island-location may offer benefits. Suther-Ness was one potential location. However, this location has a non-statutory designation within the Local Plan. It is also located some distance away from the main centre of Whalsay, and so would disadvantage foot passengers, and potentially increase the demand for vehicles on the ferry.

This option has not been considered further

6.4 Options for the Mainland Terminal Location and Configuration

Consideration has also been given to a number of options that seek to improve the Mainland terminal for ferries arriving from Whalsay. These options are described below.

- Retain Laxo

Although Laxo requires some upgrading, its location provides a number of benefits. Laxo already provides suitable accommodation for the ferries from Whalsay and there are relatively good transport links in place to provide onward links to Lerwick.

The disadvantages of Laxo as the Mainland ferry terminal include the requirement that the terminal must be retained in use during construction. As well, severe weather conditions on the route from Whalsay often force ferries to divert to Vidlin, and there is evidence that Vidlin has been used as the main terminal for extended periods.

This option has been retained for further consideration

- North side of Dury Voe – Skelberry, Levaneap

Central to the case for the development of a new terminal away from Laxo would be whether or not a new terminal would provide a significant reduction in journey time, or enable the provision of a single vessel service with the same levels of accessibility.

Opportunities for new terminal sites to the north of Dury Voe were considered. However the new locations would not provide a “step-change” in journey times, nor would they consequentially provide the opportunity to provide a single vessel service whilst maintaining existing levels of accessibility. In each location, there would be costs in facilitating new road links, and terminals capable of accommodating larger vessels. There would also be more difficulty in providing satisfactory connecting bus links from these locations.

This option has not been considered further

- Bonidale

Bonidale would provide the closest Mainland terminal to Whalsay and as such there would be a much reduced crossing time. A ferry terminal at this location could provide the first step in the introduction of a fixed link to Whalsay.

Despite this, there are a number of drawbacks related to this site. Most significantly, there would be significant technical difficulties in constructing a terminal in the deep waters (estimated to be up to 28 metres). Secondly, despite a reduced crossing time, analysis demonstrated that there would still be a requirement to maintain a two-vessel service if existing frequency of sailings were to be maintained, thus reducing opportunities to make significant operational cost savings on the route. Other concerns relate to the ability to provide a terminal that is capable of operating reliably in the full range of sea state and weather conditions, as well as the cost of providing infrastructure from Bonidale to the nearest suitable road. Overall, it was considered that the benefits of this option did not outweigh the significant costs and risks that were also associated with it.

This option has not been considered further

- South Side of Dury Voe, e.g. Billister, Dury, Grunna Voe

Opportunities for new terminal sites to the south of Dury Voe were considered. However the new locations would not provide a “step-change” in journey times, nor would they consequentially provide the opportunity to provide a single vessel service whilst maintaining existing levels of accessibility. In each location, there would be costs in facilitating new road links, and terminals capable of accommodating larger vessels. There would also be more difficulty in providing satisfactory connecting bus links from these locations

However the Grunna Voe site may offer benefits in terms of reliable berthing condition during times of inclement weather. The location will not provide a “step-change” in journey time.

Despite the costs associated with facilitating new road links, the potential for reduced dependence on the Vidlin diversionary terminal would mean that the Grunna Voe option presents a potentially more affordable option than retaining the Mainland terminal at Laxo.

The option to consider Grunna Voe has been retained for further consideration.

- Vidlin

Vidlin is already used as a relief terminal which ferries are diverted to during periods of inclement weather conditions, as well as providing the principal Mainland terminal for the Skerries service.

The Vidlin terminal could feasibly be used as a sole Mainland terminal, if used in conjunction with an alternative location on Whalsay. Otherwise, the longer crossing times from Symbister to Vidlin, compared to Laxo, do not make this an attractive option.

The possible introduction of larger vessels on the route could make the future use of Vidlin as a diversionary terminal less necessary, even though it would still be required for use by the Skerries service. There is, however, a current lack of available data on sea state and the performance of larger ferries to support this view.

The continued use of Vidlin as a Diversionary Terminal has been retained in the appraisal

- Lerwick

Lerwick was suggested as a potential Mainland terminal for ferries from Whalsay, which could be a major benefit for commuters. However, the longer crossing times would reduce overall accessibility to the Mainland from Whalsay, without the introduction of further vessels. This option would also present disadvantages for northbound commuters.

This option has not been considered further

6.5 Vessels

The range of vessel options initially considered in this study is outlined below.

- Do minimum (MV *'Linga'* and MV *'Hendra'* replaced on a broadly equivalent basis when design life reached);

This option would involve providing two new vessels of similar size to the existing ferries operating the Symbister – Laxo route, which would replace the existing vessels once their lifespan has ended. MV *'Linga'* has a 16 vehicle capacity, whilst MV *'Hendra'* has a 14 vehicle capacity. It is noted that a strictly like-for-like replacement of MV *'Hendra'* would not be achievable due to recent legislation changes governing the design of ferries.

The Do-Minimum is retained as benchmark for comparison against other options

- Large single vessel

In order to reduce costs, the possibility of providing one larger vessel to operate the Whalsay link was mentioned. The major drawback is that, despite lower operating costs, the vessel would provide a significantly reduced level of accessibility between Whalsay and the Mainland. This would undermine the current socio-economic viability of the island, and provide a less robust service in the event of service disruption.

This option has not been considered further

- 2 x 16 vehicle capacity vessels

This option involves two MV *'Linga'* sized vessels. This option would not provide significant advantages over and above the do-minimum option. Results of the demand forecasting work suggest the requirement for the introduction of significantly larger vessels in order to meet future potential demand for vehicles.

This option has not been considered further

- 2 x 31 vehicle capacity vessels

In response to peak period capacity problems, and also due to future trends predicting that vehicle sizes will continue to become larger, it has been proposed to provide two large vessels that can carry up to 31 vehicles. These would be similar to MV *Daggri* and MV *Dagalien* currently in operation on the Yell Sound route.

This option could address future capacity requirements, and provide benefits in relation to wider network inter-compatibility.

This option has been retained for further consideration

- Combination of 16 vehicle capacity vessel and larger sized vessel (i.e. 31 vehicle capacity)

This option maintains MV *'Linga'* on the route, but introduces a larger vessel to operate alongside it. It may provide a flexible option, allowing for future uncertainties on the route, whilst allowing for wider network benefits, and immediate provision of increased capacity.

This option has been retained for further consideration

A number of other options have been explored and are outlined below.

- High speed ferry

A review of available high-speed ferries found that whilst feasible in principle, the difficulties of introducing a unique vessel into the existing fleet, as well as the requirement to maintain a conventional vessel alongside the fast ferry would make this option operationally unattractive. Fast ferries also have higher operational costs, and could suffer more weather related disruption.

This option has not been considered further

- Service optimisation

Opportunities to make better use of MV *Filla* (the Skerries ferry) or use of relief vessels were considered.

Initial work found that attempting to work MV *Filla* into the existing ferry timetable, or either of the fleet relief vessels, to provide peak additional capacity would be unsatisfactory. The use of MV *Filla* would ultimately replace problems on the Whalsay route, with a new set of problems on the Skerries route. Furthermore, as this vessel has stern only loading, its use on the Whalsay route would be more inefficient. An analysis of the usage of the fleet relief vessels showed that, on average, they would not be available on the Whalsay route for 1 in every 3 days, which would be unsatisfactory.

These options have not been considered further

6.6 Other Options

The potential for linking Whalsay to the Mainland via a bridge or a tunnel are further options that have been considered and are discussed below.

- Bridge or Tunnel Fixed Links

Whilst a bridge or tunnel between Whalsay and the Mainland would provide considerable accessibility benefits to Whalsay, the funding and delivery context of a fixed link would mean that completion of a replacement transport link would realistically take place 15 to 20 years in the future when the existing ferry infrastructure is expected to reach the end of serviceable life in 2014. Whilst the RTS is supportive of exploring fixed links to Whalsay along with Bressay, Unst and Yell, the Whalsay fixed link would be the longest and most technically difficult and the consultation exercise showed that Whalsay is lower down the list of priorities for a fixed link than the others.

These options have not been considered further.

6.7 Options Taken Forward to STAG Part 1 Appraisal

The different elements highlighted above in relation to the island terminal, Mainland terminal, vessels, and fixed links have been combined to form seven specific options, which are outlined below. Option 1 is a do-minimum option, required to provide a benchmark of performance against other options. The Options are described below, whilst Table 6.1 provides a summary of each of the Options.

Option 1 – Do Minimum

This option is defined as follows:

- Mainland Terminal – Laxo and Vidlin, renewed or replaced on a like-for-like basis.
- Island Terminal – Current location within Symbister Harbour, renewed or replaced on a like-for-like basis.
- Vessels - MV *'Linga' and* MV *'Hendra'* retained until life expiry, then replaced on a broadly like-for-like basis

Option 2 – Symbister Harbour (inward extension) to Laxo (Vidlin diversionary) using MV *'Linga'* and one new larger vessel (nominally, with 31 vehicle capacity).
This option is defined as follows:
- Mainland Terminal - Laxo as Mainland terminal, with Vidlin retained as diversionary terminal. Both terminals replaced with new, larger terminals capable of accommodating 31 vehicle capacity vessels.
- Island Terminal – Harbour extension at Symbister with larger berth and linkspan capable of accommodating 31 vehicle capacity vessels.
- Vessels – New 31 vehicle capacity vehicle introduced. MV *'Linga'* retained until life expiry and then replaced to provide a vessel with similar vehicle carrying capacity.

Option 3 – Symbister Harbour (inward extension) to Laxo (Vidlin diversionary) using two new larger vessels (nominally, with 31 vehicle capacity)
This option is defined as follows:
- Mainland Terminal - Laxo as the Mainland terminal, with Vidlin retained as diversionary terminal. Both terminals replaced with new, larger terminals capable of accommodating 31 vehicle capacity vessels.
- Island Terminal – Harbour extension at Symbister with larger berth and linkspan capable of accommodating 31 vehicle capacity vessels.
- Vessels – Two new 31 vehicle capacity vessels introduced onto the route.

Option 4 – North Voe to Laxo (Vidlin diversionary) using MV *'Linga'* and one new larger vessel (nominally, with 31 vehicle capacity)
This option is defined as follows:
- Mainland Terminal - Laxo as the Mainland terminal, with Vidlin retained as diversionary terminal. Both terminals replaced with new, larger terminals capable of accommodating 31 vehicle capacity vessels.
- Island Terminal – New ferry facility developed within the North Voe. Larger terminal capable of accommodating 31 vehicle capacity vessels.
- Vessels – New 31 vehicle capacity vessel introduced. MV *'Linga'* retained until life expiry and then replaced to provide a vessel with similar vehicle carrying capacity.

Option 5 – North Voe to Laxo (Vidlin diversionary) using two new larger vessels (nominally, with 31 vehicle capacity)
This option is defined as follows:
- Mainland Terminal - Laxo as the Mainland terminal, with Vidlin retained as diversionary terminal. Both terminals replaced with new, larger terminals capable of accommodating 31 vehicle capacity vessels.
- Island Terminal – New ferry facility developed within the North Voe. Larger terminal capable of accommodating 31 vehicle capacity vessels.
- Vessels – Two new 31 vehicle capacity vessels introduced.

Option 6 – Not Used
This option was identified in the original STAG Part 1 study as a bridge option. The Option has now been removed from further consideration on the grounds that pursuing the option would realistically culminate in interruption of the transport link over the span of a number of years until a possible bridge could be in use.

Option 7 – Not Used
This option was identified in the original STAG Part 1 study as a tunnel option. The Option has now been removed from further consideration on the grounds that pursuing the option would realistically culminate in interruption of the transport link over the span of a number of years until a possible tunnel could be in use.

Option 8 – Symbister (inward extension) to Grunna Voe using MV *'Linga'* and one new larger vessel (nominally, with 31 vehicle capacity)

This option is defined as follows:

- Mainland Terminal – New ferry terminal facility developed at Grunna Voe. Larger terminal capable of accommodating 31-vehicle capacity vessels
- Island Terminal – Harbour extension at Symbister. Larger terminal capable of accommodating 31 vehicle capacity vessels.
- Vessels – New 31 vehicle capacity vessel introduced. MV *'Linga'* retained until life expiry and then replaced to provide a vessel with similar vehicle carrying capacity.

Option 9 – North Voe to Grunna Voe using MV *'Linga'* and one new larger vessel (nominally, with 31 vehicle capacity)

This option is defined as follows:

- Mainland Terminal – New ferry terminal facility developed at Grunna Voe. Larger terminal capable of accommodating 31-vehicle capacity vessels
- Island Terminal – New ferry facility developed within the North Voe. Larger terminal capable of accommodating 31 vehicle capacity vessels.
- Vessels – New 31 vehicle capacity vessel introduced. MV *'Linga'* retained until life expiry and then replaced to provide a vessel with similar vehicle carrying capacity.

Table 6.1: Summary of Options Taken Forward to STAG Part 1 Appraisal

	Mainland Terminal	Whalsay Terminal	Vessels
Option 1	Laxo and Vidlin, renewed or replaced on a like-for-like basis.	Current location within Symbister Harbour, renewed or replaced on a like-for-like basis.	MV *'Linga' and* MV *'Hendra'* retained until life expiry, then replaced on a broadly like-for-like basis.
Option 2	Laxo as the Mainland terminal, with Vidlin retained as diversionary terminal. Both terminals replaced with new, larger terminals capable of accommodating 31 vehicle capacity vessels.	Harbour extension at Symbister with larger berth and linkspan capable of accommodating 31 vehicle capacity vessels.	New 31 vehicle capacity vehicle introduced. MV *'Linga'* retained until life expiry and then replaced to provide a vessel with similar vehicle carrying capacity.
Option 3	Laxo as the Mainland terminal, with Vidlin retained as diversionary terminal. Both terminals replaced with new, larger terminals capable of accommodating 31 vehicle capacity vessels.	Harbour extension at Symbister with a larger berth and linkspan capable of accommodating 31 vehicle capacity vessels.	Two new 31 vehicle capacity vessels introduced onto the route.
Option 4	Laxo as the Mainland terminal, with Vidlin retained as diversionary terminal.	New ferry facility developed within the North Voe. Larger terminal capable of accommodating 31 vehicle capacity vessels.	New 31 vehicle capacity vessel introduced. MV *'Linga'* retained until life expiry and then replaced to provide a vessel with similar vehicle carrying capacity.

	Mainland Terminal	Whalsay Terminal	Vessels
Option 5	Laxo as the Mainland terminal, with Vidlin retained as diversionary terminal. Both terminals replaced with new, larger terminals capable of accommodating 31 vehicle capacity vessels.	New ferry facility developed within the North Voe. Larger terminal capable of accommodating 31 vehicle capacity vessels.	Two new 31 vehicle capacity vessels introduced.
Option 6*	n/a	n/a	n/a
Option 7*	n/a	n/a	n/a
Option 8	New ferry terminal facility developed at Grunna Voe. Larger terminal capable of accommodating 31-vehicle capacity vessels.	Harbour extension at Symbister with a larger berth and linkspan capable of accommodating 31 vehicle capacity vessels.	New 31 vehicle capacity vessel introduced. MV *'Linga'* retained until life expiry and then replaced to provide a vessel with similar vehicle carrying capacity.
Option 9	New ferry terminal facility developed at Grunna Voe. Larger terminal capable of accommodating 31-vehicle capacity vessels	New ferry facility developed within the North Voe. Larger terminal capable of accommodating 31 vehicle capacity vessels.	New 31 vehicle capacity vessel introduced. MV *'Linga'* retained until life expiry and then replaced to provide a vessel with similar vehicle carrying capacity.

* Option 6 and Option 7 were identified in the original STAG Part 1 appraisal to take forward. Circumstances have changed since the original STAG Part 1 study concluded in 2005 and Options 6 and 7 have subsequently been dropped.

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Option Development

7 Option Development

7.1 Options

The following chapter details each of the option packages that were identified in the preceding chapter and considers the practical arrangements in more detail.

7.1.1 Do-Minimum

The Do-Minimum maintains the *status quo* on the route and replacing the existing vessels once they have reached the end of serviceable life. MV *'Hendra'* would need replacing in 2014 and MV *'Linga'* would require replacing in 2027. The replacement vessels would have the same capacity as the existing vessels, with the vehicle capacities of MV *'Linga'* and MV *'Hendra'* at 16 vehicles and 14 vehicles, respectively.

Similarly, the ferry terminals would remain at Symbister and Laxo, with ongoing maintenance required to allow continued operation. Vidlin would be retained as a diversionary terminal during periods of inclement weather.

Service levels in the Do-Minimum option would be retained at 36 sailings per day from Monday through Saturday and 28 sailings on a Sunday.

The capital costs for the Do-Minimum are estimated to be £8.64 million over the first ten years of the appraisal. This would see MV *'Hendra'* replaced and suitable upgrade works undertaken on the three ferry terminals (Laxo, Symbister and Vidlin) to safeguard them for future use.

7.1.2 Option 2 – Symbister Harbour (with extension) to Laxo (Vidlin diversionary) using MV *'Linga' and one new larger vessel (nominally, with 31-vehicle capacity)*

This option comprises:

- Laxo retained as the Mainland terminal location with new, larger terminal capable of accommodating 31-vehicle capacity vessels;
- Symbister Harbour is retained as ferry terminal location, with a harbour extension providing a new ferry berth and linkspan (capable of accommodating 31-vehicle capacity ferries);
- MV *'Linga'* retained until the end of serviceable life and then replaced to provide a vessel with similar vehicle carrying capacity;
- One new 31-vehicle capacity vessel introduced to replace MV *'Hendra'*; and
- Retention of Vidlin with upgrades to accommodate the 31-vehicle vessel.

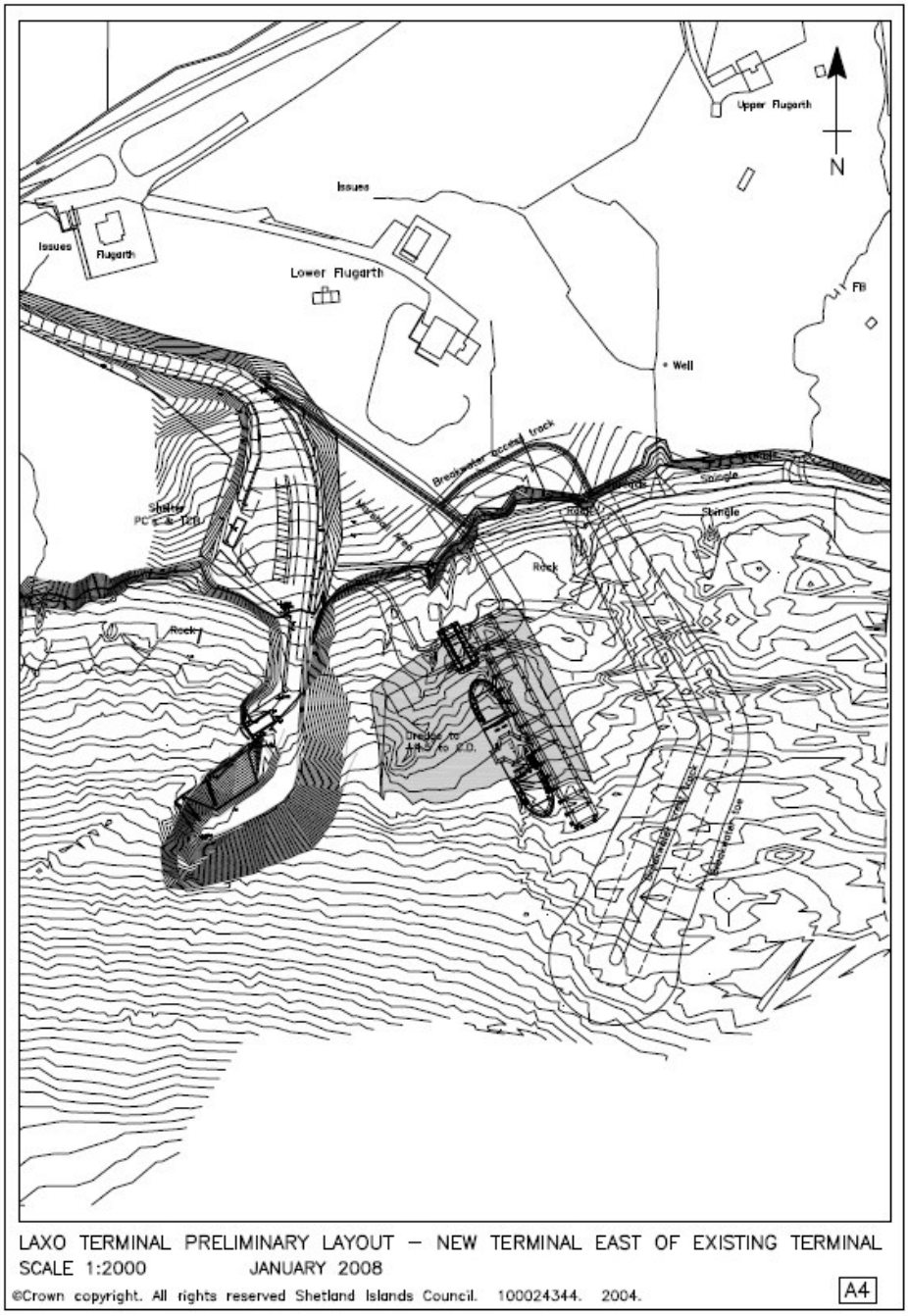
The Option 2 package requires three upgraded or new ferry terminals, one of which (Laxo) requires a breakwater extension (Symbister may require a breakwater extension depending the form of the extension). All three new terminals would be connected to existing road infrastructure.

The new ferry terminal at Laxo would be constructed adjacent to the existing terminal. Ferry services to Laxo are not expected to be significantly during construction. The new terminal, including pier and breakwater extension, is expected to cost £6.7 million.

Service levels in this option would be retained at 36 sailings per day from Monday through Saturday and 28 sailings on a Sunday.

Figures 7.1 details the ferry terminal proposed at Laxo with a breakwater extension.

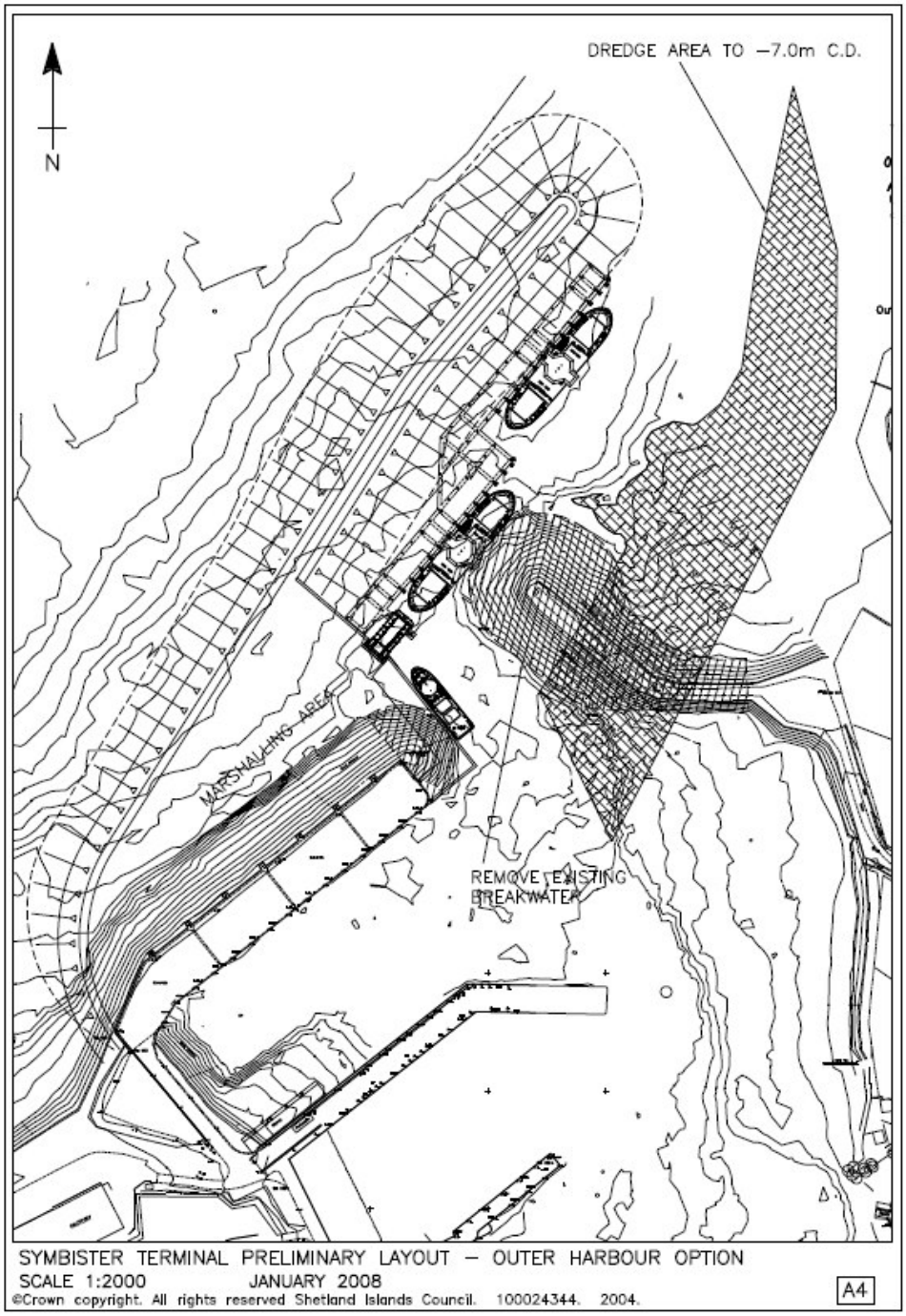
Figure 7.1 Proposed New Laxo Ferry Terminal (capable of accommodating 31-vehicle capacity ferry vessels)



There are two sub-options associated with the proposed ferry terminal at Symbister with a breakwater extension: (a) outward extension, and (b) inward extension. Figure 7.2.a and 7.2.b show these two sub-options.

Sub-Option (a)

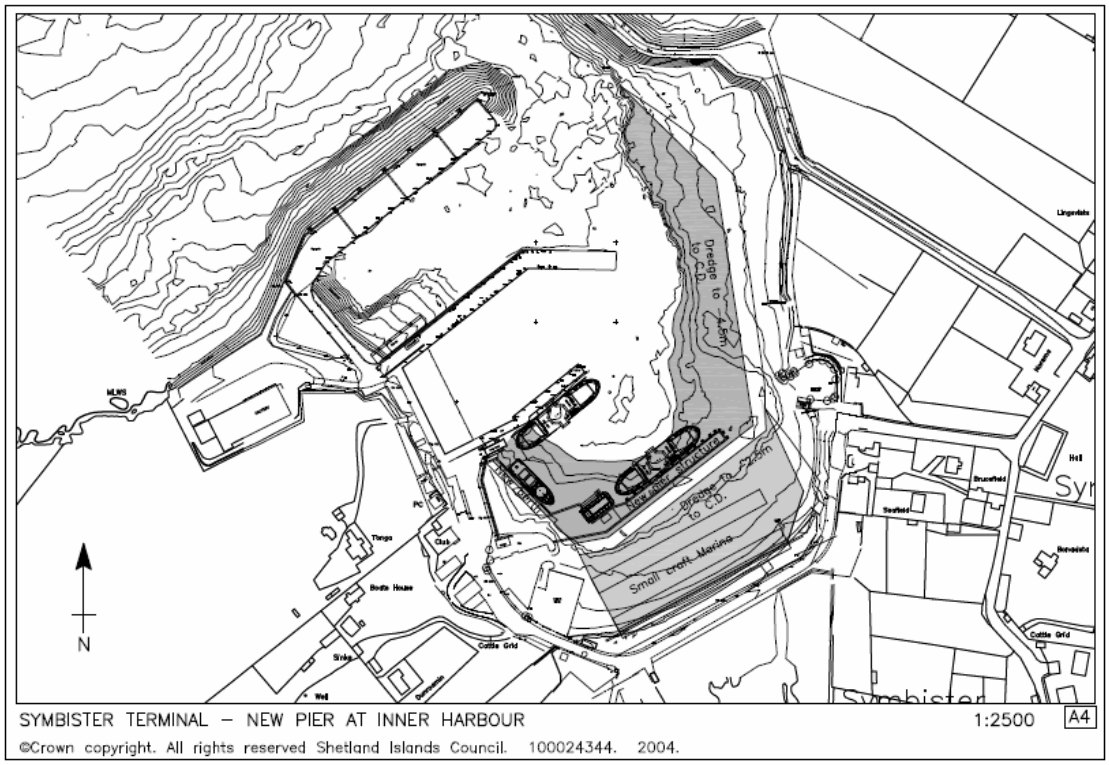
Figure 7.2.a: Proposed ferry terminal at Symbister Harbour with Outward extension



The outward extension involves the construction of a breakwater into a water depth of approximately 16 m. There is a high degree of risk associated with this water depth, which could significantly impact construction times and cost of the outward extension. The outward breakwater extension would require an area of the harbour to be dredged, and would also pose ferry service disruptions during construction. Costs for the new terminal and outward extension at Symbister are estimated to be £16.36 million.

Sub-Option (b)

Figure 7.2.b: Proposed ferry terminal at Symbister Harbour with Inward extension



The inward extension proposed at Symbister Harbour involves a smaller breakwater with fewer risks associated with construction. A proportion of Symbister Harbour would require to be dredged. Some engineering issues associated with an inward extension are still to be resolved and work would be required whilst services continued at Symbister. Costs for the new terminal and inward extension at Symbister are estimated to be £12.93 million.

With MV *'Linga'* in operation, Vidlin could continue to operate as a diversionary terminal, albeit with increasing maintenance costs. The proposed 31-vehicle capacity ferry vessel would not be able to berth at Vidlin without significant upgrades to the terminal. Upgrades to Vidlin to allow the 31-vehicle capacity ferry vessel to berth are estimated to cost £3.8 million.

Vidlin is an important element of the Option 2 package, as it provides greater reliability to the transport link between Whalsay and the Mainland. In 2005, for example, 8.2% of all sailings were diverted to Vidlin. Without upgrades in the Option 2 package, Vidlin could serve half of all would-be diverted sailings (i.e. those operated by MV *'Linga'*), whilst upgrading would allow all diverted sailings to berth at Vidlin.

7.1.3 *Option 3 – Symbister Harbour (with extension), with Laxo terminal and using Vidlin as a diversionary terminal, using two new larger vessels (nominally, with 31-vehicle capacity)*

Option 3 comprises:

- Laxo retained as the Mainland terminal location with new, larger terminal capable of accommodating 31-vehicle capacity ferry vessels;
- Symbister Harbour is retained as ferry terminal location, with a harbour extension providing a new ferry terminal (capable of accommodating 31-vehicle capacity ferries) and possibly a breakwater extension;
- Two new 31-vehicle capacity vessels introduced onto the route; and
- Retention of Vidlin with upgrades to accommodate the 31-vehicle vessels.

The Option 3 package requires three upgraded or new ferry terminals, two of which (Laxo and Symbister) require a breakwater extension. All three terminals would be connected to existing road infrastructure.

The new ferry terminal at Laxo would be constructed adjacent to the existing terminal. Ferry services to Laxo are not expected to be disrupted during construction. The new terminal is expected to cost £6.7 million.

A new ferry terminal is proposed at Symbister Harbour. As in Option 2, there are two sub-options for the Symbister Harbour ferry terminal, one involving an outerward extension with new breakwater and the other involving an inward extension. The two sub-options involve different degrees of risk, cost and service disruptions during construction. Both sub-options require sections of Symbister Harbour to be dredged (see Option 2 for full description).

The addition of the 31-vehicle capacity vessels will increase capacity on all sailings. Service levels would remain the same as the Do-Minimum option, with 36 sailings per day Monday to Saturday and 28 sailings per day on a Sunday. The addition of a second 31-vehicle capacity vessel will increase capacity on all sailings.

Option 3 proposes consideration of the retention of the Vidlin terminal with upgrades. Without upgrades, Vidlin would not be able to accommodate any diverted sailings of the new larger vessels.

7.1.4 Option 4 – North Voe to Laxo (Vidlin diversionary) using MV *'Linga' and one new larger vessel (nominally, with 31-vehicle capacity)*

This option comprises:

- Laxo retained as the Mainland terminal location with new, larger terminal capable of accommodating 31-vehicle capacity vessels;
- New ferry facility capable of accommodating 31 vehicle capacity vessels is developed within the North Voe on Whalsay;
- MV *'Linga'* is retained until the end of serviceable life and then replaced to provide a vessel with similar vehicle carrying capacity;
- A new 31 vehicle capacity vessel is introduced; and
- Retention of Vidlin with upgrades to accommodate the 31-vehicle vessel.

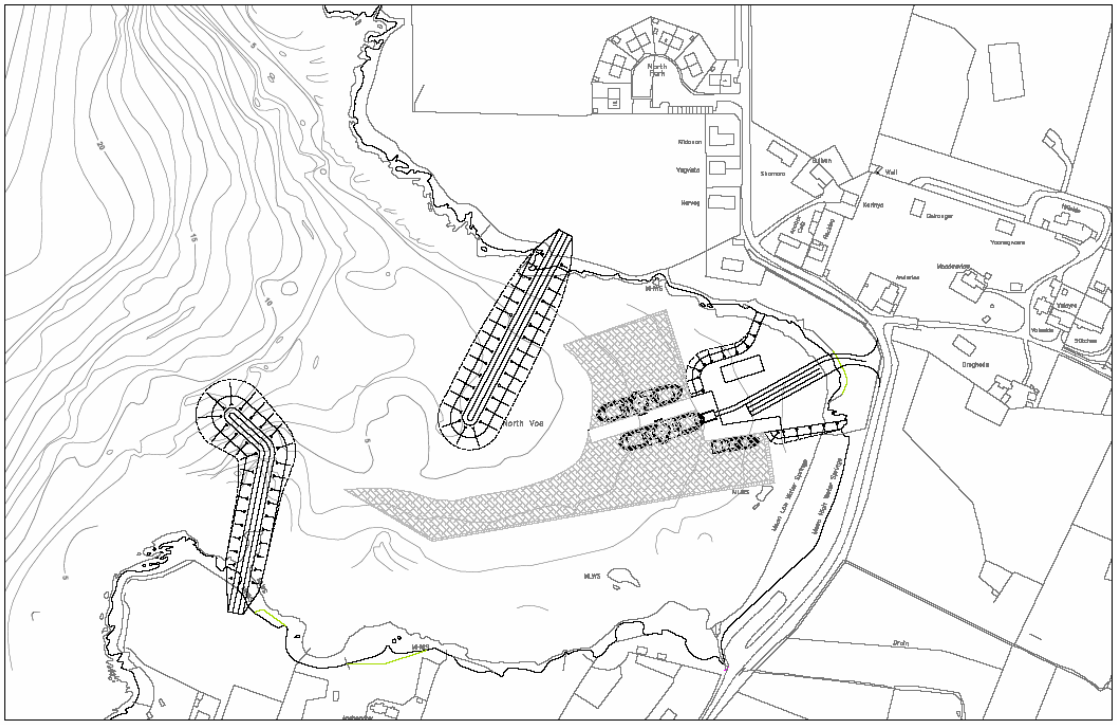
Option 4 is similar to Option 2, the only difference being the re-location of the island ferry terminal to North Voe. A new ferry terminal on North Voe would be located near the head of the voe and would include two breakwaters. A short access road (< 50 metres) would require to be constructed as part of the terminal road development. Sections of North Voe harbour would require to be dredged. The existing ferry terminal at Symbister would be taken out of service and the fishing industry and marina would continue to use the existing and vacated facilities.

Service levels would remain the same as the Do-Minimum option, with 36 sailings per day Monday through Saturday and 28 sailings on Sundays. The addition of a 31-vehicle capacity vessel will increase capacity on some of those sailings.

The North Voe ferry terminal would be capable of accommodating larger ferry vessels (i.e. 31-vehicle capacity) and would involve two small breakwaters. Figure 7.3 shows the proposed ferry terminal arrangement at North Voe.

Locating the terminal at North Voe is estimated to cost £10.3 million and includes decommissioning costs for the existing ferry facility in Symbister Harbour.

Figure 7.3: Proposed ferry terminal at North Voe



Mathematical modelling has been undertaken with regard to the North Voe option. Further wave modelling will be required prior to development.

7.1.5 *Option 5 – North Voe to Laxo (Vidlin diversionary) and two new larger vessels (nominally, with 31 vehicle capacity each)*

This option comprises:

- Laxo retained as the Mainland terminal location with new, larger terminal capable of accommodating 31-vehicle capacity vessels;
- New ferry facility capable of accommodating 31-vehicle capacity vessels is developed within the North Voe on Whalsay;
- MV *'Linga'* is retained until the end of serviceable life and then replaced to provide a vessel with similar vehicle carrying capacity;
- Two new 31-vehicle capacity vessels introduced; and
- Retention of Vidlin with upgrades to accommodate the 31-vehicle vessel.

A new ferry terminal on North Voe would be located at the head of the voe and would include two breakwaters. A short access road (< 50 metres) would require to be constructed as part of the terminal road development.

Figures 7.1 and 7.3, as shown in Option 4, show the proposed terminals at Laxo and North Voe, respectively.

The addition of two 31-vehicle capacity vessels will increase capacity on all sailings. Service levels would remain the same as the Do-Minimum option, with 36 sailings per day Monday through Saturday and 28 sailings on Sundays.

Locating the terminal at North Voe is estimated to cost £10.3 million and includes decommissioning costs for the existing facility in Symbister Harbour.

7.1.6 *Option 8 - Grunna Voe Mainland terminal, Symbister Harbour with extension, plus one larger ferry vessel and retention of* MV *'Linga' (replaced on a like-for-like basis at end of operational lifespan)*

This option proposes relocating the Mainland ferry terminal to Grunna Voe on the south side of Dury Voe. The crossing time is assumed to be the same as the Do-Minimum option. This option assumes that Vidlin would not be upgraded. The option of locating the Mainland ferry terminal for the Whalsay service at Grunna Voe offers greater shelter and favourable berthing conditions than those at the Laxo terminal. Berthing conditions are one element that can be affected by inclement weather. Crossing conditions during periods of inclement weather, however, may still not be possible with acceptable levels of safety and comfort and diversion to Vidlin would still be necessary during those times. For this reason, the option has been considered with only one larger 31-vehicle vessel operating in conjunction with MV *'Linga',* which could divert if necessary to Vidlin.

Option 8 comprises the following elements:

- New Ferry terminal at Grunna Voe, with the Laxo ferry terminal taken out of service;
- Symbister Harbour is retained as ferry terminal location, with a harbour extension providing a new ferry terminal (capable of accommodating 31-vehicle capacity ferry vessels);
- Use of MV *'Linga'* until end of its serviceable life followed by replacement with a vessel with similar carrying capacity; and
- A new 31-vehicle capacity vessel is introduced.

The crossing time from Whalsay to the Mainland is expected to be the same as the Do-Minimum (existing) crossing time of approximately 30 minutes. The journey on the Mainland would require an additional 1 km of road travel to reach the Grunna Voe proposed terminal site from the A970 junction.

Service levels would remain the same as the Do-Minimum option, with 36 sailings per day Monday through Saturday and 28 sailings on Sundays. The addition of a 31-vehicle capacity vessel, will increase capacity on the sailings it will operate.

Vidlin would be retained as a diversionary terminal when the ferries cannot cross and berth at Grunna Voe. Without upgrades, the larger ferry could not berth. Within this option it is proposed that detailed monitoring is undertaken of the number and proportion of sailings diverted to Vidlin along with a reason for the diversion. It is proposed that these records then be used to inform future decision making regarding the long-term future of the Vidlin terminal.

A new ferry terminal is proposed at Symbister Harbour. As in Option 2, there are two sub-options for the Symbister Harbour ferry terminal, one involving an outerward extension with new breakwater and the other involving an inward extension. The two sub-options involve different degrees of risk, cost and service disruptions during construction. Both sub-options require sections of Symbister Harbour to be dredged (see Option 2 for full description).

There is currently an unpaved access road and an existing pier at the site of the proposed terminal. There are a few salmon farming sites near Grunna Voe, however, these are not expected to pose any problems with operation of the ferry service.

Construction of a terminal at Grunna Voe is not expected to impact on ferry service operations

. Symbister Harbour would require works whilst services remain in operation.

Figures 7.4 and 7.5 show the location of the proposed Grunna Voe terminal, and the proposed design of the terminal.

Figure 7.4: Location of the proposed Grunna Voe ferry terminal

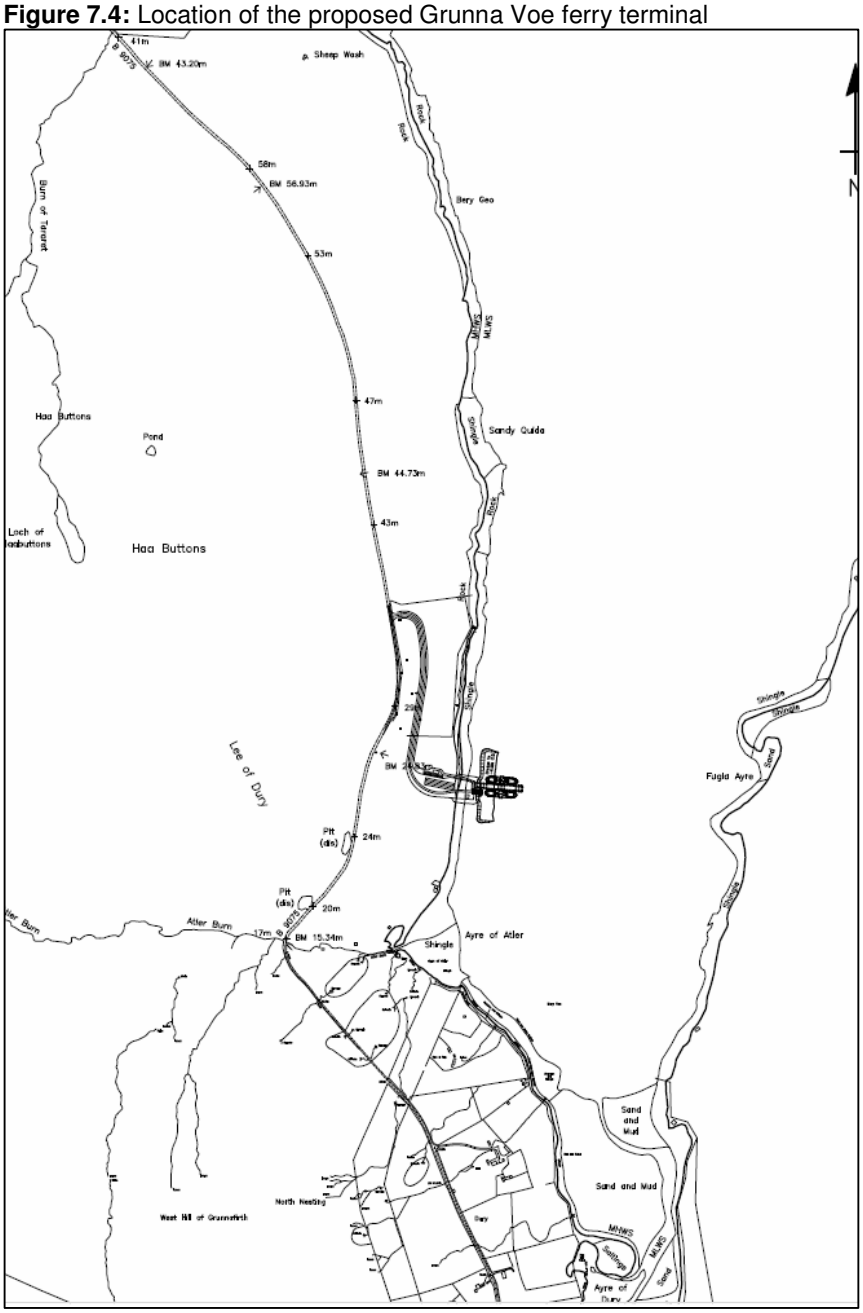
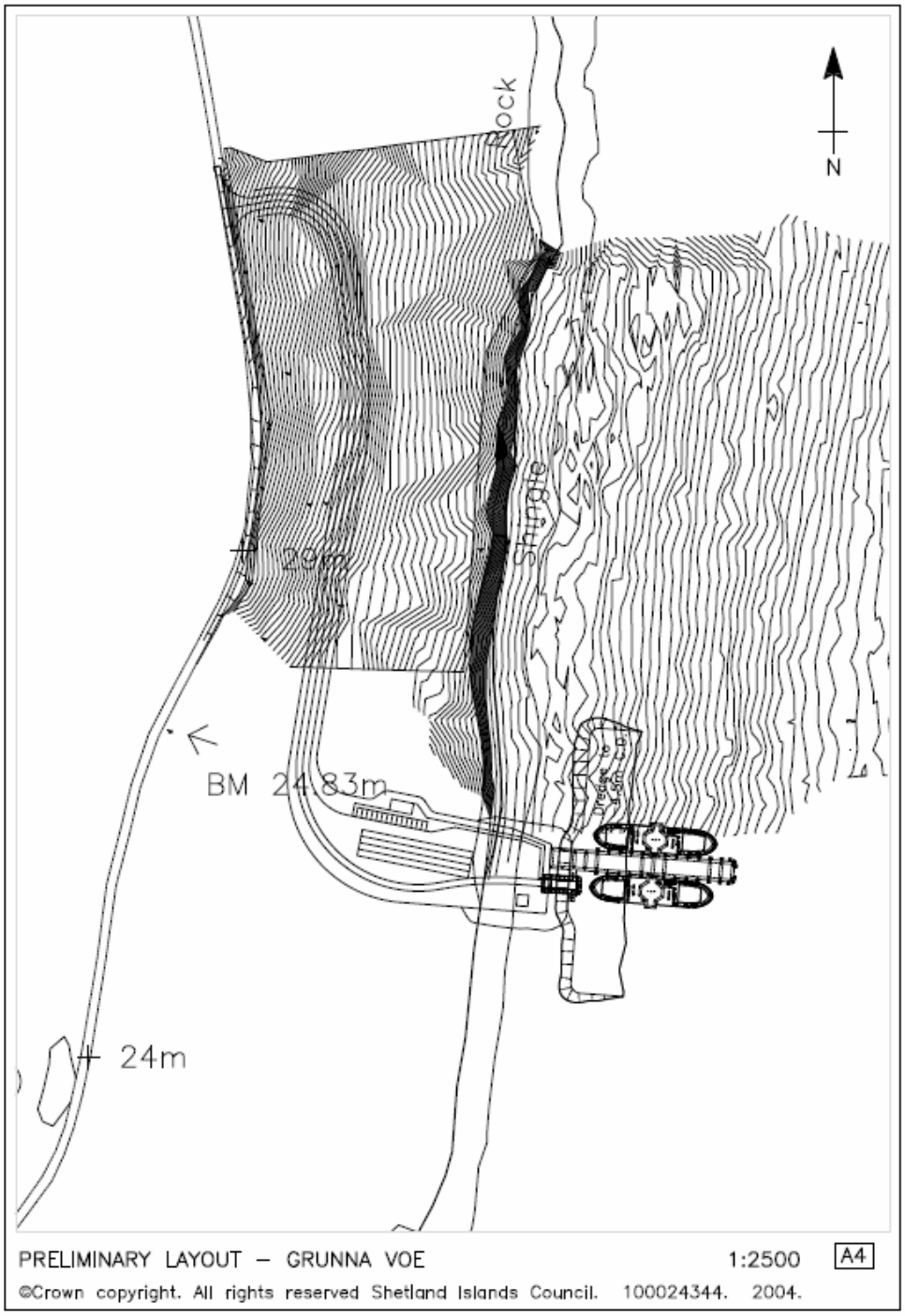


Figure 7.5: Proposed Grunna Voe ferry terminal (detail)



7.1.7 *Option 9 - Grunna Voe Mainland terminal, North Voe Terminal, plus one larger ferry vessel and retention of* MV *'Linga' (replaced on a like-for-like basis at end of operational lifespan)*

This option proposes relocating the Mainland ferry terminal to Grunna Voe on the south side of Dury Voe and re-locating the Whalsay ferry terminal to North Voe. The crossing time is assumed to be the same as the Do-Minimum option. This option assumes that Vidlin would not be upgraded. The option of locating the Mainland ferry terminal for the Whalsay service at Grunna Voe offers greater shelter and favourable berthing conditions than those at the Laxo

terminal. Berthing conditions are one element that can be affected by inclement weather. Crossing conditions during periods of inclement weather, however, may still not be possible and diversion to Vidlin would still be necessary during those times. For this reason, the option has been considered with only one larger 31-vehicle vessel operating in conjunction with MV *'Linga,'* which could divert if necessary to Vidlin.

Option 9 comprises the following elements:

- New Ferry terminal at Grunna Voe, with the Laxo ferry terminal taken out of service;
- New ferry terminal at North Voe;
- Use of MV *'Linga'* until end of its serviceable life followed by replacement with a like-for-like replacement; and
- A new 31-vehicle capacity vessel is introduced.

The proposed terminal at Grunna Voe would be capable of accommodating larger ferry vessels. Figures 7.4 and 7.5 (above) show the location and design of the proposed terminal.

The crossing time from Whalsay to the Mainland is expected to be the same as the Do-Minimum (existing) crossing time of approximately 30 minutes. The journey on the Mainland would require an additional 1 km of travel to reach the Grunna Voe proposed terminal site from the A970 junction.

Service levels would remain the same as the Do-Minimum option, with 36 sailings per day Monday through Saturday and 28 sailings on Sundays. The addition of the larger 31-vehicle capacity vessel will increase capacity on those sailings. MV *'Linga'* would be retained until the end of her serviceable life followed by a like for like replacement vessel

Vidlin would be retained as a diversionary terminal for MV *'Linga'* when the ferries cannot cross and berth at Grunna Voe. It is proposed that detailed monitoring is undertaken of the number and proportion of sailings diverted to Vidlin along with a reason for the diversion. It is proposed that these records then be used to inform future decision making regarding the long-term future of the Vidlin terminal.

There is currently an unpaved access road and an existing pier at the site of the proposed terminal. There are a few salmon farming sites near Grunna Voe, however, these are not expected to pose any problems with operation of the ferry service.

Construction of terminal at Grunna Voe is not expected to impact on ferry service operations.

7.2 Summary

This Chapter has presented the options that have been considered for the future provision of transport links for Whalsay. It has shown the option sifting process and provided details about the list of options being put forward for STAG Part 1 Appraisal. A STAG Part 1 appraisal was undertaken to assess the packages. Outcomes from the initial appraisal process are detailed in Chapter 9 of this report.

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Consultation

8 Consultation

8.1 Introduction

Consultation is a key feature of the STAG process and is a required element within each phase of study. This Chapter details the consultations that were undertaken throughout for the Whalsay STAG study.

8.2 STAG Part 1

Initial consultations for the STAG process historically included:

- Discussion with the Whalsay Community Council;
- Resident and Business Questionnaire;
- Public meeting;

As part of the initial consultations for the Whalsay STAG study, further consultation was undertaken to include:

- Face-to-face and telephone meetings with key Whalsay stakeholders;
- An open-day consultation event on Whalsay; and
- Discussions with other relevant stakeholders.

As a result of the public meeting held in 2004, it was decided to form a Whalsay Ferries and Terminals Working Group, formed from key members of the community, and the subsequent meetings by this group have also greatly assisted the consultation phase of this commission.

Stakeholders were able to assist with the identification of problems and opportunities, and, towards the end of the study, inform the Option appraisal process. Consultations undertaken as part of the STAG Part 1 process are detailed below:

- Community Stakeholders

Community members were given opportunities to provide views on the various options to improve the Whalsay link to the Mainland.

- Questionnaires

In June 2004, SIC produced a questionnaire to explore local views on the existing Whalsay ferry service. Questionnaires were sent to all households and businesses in Whalsay and a response rate of over 50% was achieved.

- Public Meeting

Following the results of the questionnaire, a public meeting was convened on the 29th of September 2004 in order to develop a clearer understanding of the key issues related to the Whalsay links project. The public meeting also offered community stakeholders the opportunity to ask the Council some key questions, such as the timescales for terminal and ferry replacement, and how funding for the project would be sourced.

- Open Consultation Days

An “Open Day” consultation event held on the 24th of February 2005 also allowed local stakeholders to voice their opinions on the Whalsay link. The event was advertised at the main shops and facilities on the island, and on the ferries themselves.

- Whalsay Ferries and Terminals Working Group

The Whalsay Ferries and Terminals Working Group was established following the public meeting on the 19th September, 2004, which recommended that there was a need to form a working group, comprising councillors and local stakeholders, to move the project forward. The agreed remit of the group was focussed upon addressing the problems arising from the current operation of the ferry service. The working group has also been used to help with option

development and sieving, and the weighing up of the advantages and disadvantages of the various vessel and terminal options.

- Other Island Stakeholders

Fact finding consultation was undertaken with a range of specific Whalsay stakeholders. Such stakeholders ranged from local shop owners and fisherman, to teachers and local Councillor.

- Shetland Island Council Services

A range of officers from various departments of Shetland Islands Council were also consulted, ranging from the Planning and Finances Departments to the Economic Development Unit.

- Other Stakeholders

A range of other services were consulted in order to ensure that a holistic set of views were gathered and included consultation with parties such as the Tourist Office, the Accident and Emergency team leader for Shetland, as well as Shetland Enterprise and Scottish Natural Heritage representatives.

8.3 ZetTrans Regional Transport Strategy

Consultation work with relevant consultees was undertaken for the RTS and took consideration of the transport link between Whalsay and the Mainland. Notes from these consultations were revisited for the purposes of informing the progress of the Whalsay STAG study.

8.4 Environment

Following stipulations set out in STAG guidance for the appraisal of the environmental objectives, the appraisal process was informed by comments received by Scottish Natural Heritage, Scottish Environment Protection Agency, Historic Scotland, the Health and Safety Executive plus Shetland Islands Council's Coastal Zone Manager. Received comments and feedback are provided in Appendix C of this report.

8.5 STAG Part 2

Stakeholder consultations undertaken as part of the STAG Part 2 process began in 2007, and included the following:

- Ferry User Survey.

A two-day ferry user survey was undertaken in October 2007 in order to inform the study. A total of 274 surveys were completed over the course of 36 sailings over the course of two days. Results of the survey are detailed in Appendix A.

- Consultation Workshops

Three workshops were held at the Whalsay Primary School and invitees included members of the Ferry Services and Terminals working group. Attendees were appraised of emerging information and study developments. This was followed by a general discussion where attendees were provided the opportunity to comment on the study and helped to inform the Option appraisal process. Workshops were held on 5th December 2007 and 7th February 2008 and on 14th April, 2008. Notes of Discussion from the workshops are provided in Appendix D.

- Drop-In Session

A drop-in session was held prior to workshop held on 7th February 2008. The main purpose of the session was to provide stakeholders the opportunity to ask questions about the design and cost of options. The drop-in session was also intended to provide stakeholders with additional opportunity to comment on the study and appraisal of Options.

8.6 Summary

A number of common themes arose throughout the consultation exercises with regard to the future provision of a transport link to Whalsay. There was no doubt amongst the stakeholders that the age of the vessels and the infrastructure was the greatest threat to the link and that the Do Nothing scenario was not a satisfactory option. Problems with travel during peak hors were raised with concern about the ability of people on Whalsay to maintain a job on the Mainland raised as a result of capacity constraints. Service reliability was considered to be key to people who work on the Mainland.

Laxo was considered to be the most appropriate Mainland terminal location and Vidlin was considered essential to the service to provide the reliability due to the problems with south easterly weather.

Opinion was divided with regard to continued use of the harbour at Symbister for ferry operations versus a new terminal at North Voe. Many people would like to see North Voe developed as it provides a more efficient means for the ferry operations and returns Symbister to the fishing industry. Others have concerns about the environmental and visual impact of building a new terminal and the associated infrastructure is an undeveloped voe.

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STAG Part 1 Appraisal

9 STAG Part 1 Appraisal

9.1 Introduction

This Chapter provides an overview of the results of the STAG 1 appraisal.

The appraisal is broken into three main categories:

- Performance against planning objectives;
- Implementability; and
- Performance against Government objectives.

Consideration is given to how well each option responds to the planning objectives, as set out in Chapter 5. It then continues to consider the performance of the options against four specific "implementability" criteria:

- Technical feasibility;
- Operational feasibility;
- Affordability; and
- Public acceptability.

Finally, the options are broadly assessed in relation to five Government transport objectives of Environment; Safety; Economy; Integration; and Accessibility and Social Inclusion.

Appraisal Summary Tables (ASTs) have been completed for the STAG Part 1 assessment and are provided in Appendix E of this report.

9.2 Performance Against Planning Objectives

The performance of each of the seven options against each of the objectives is summarised below.

Objective 1: To deliver a solution that is affordable (for funding bodies)

Currently, there is no provision for upgrades to the Whalsay route identified within any committed capital plan. Committed funding only relates to the continuation of the current service, and does not include anything other than "running repairs and maintenance" to the existing terminals and vessels.

Accordingly, at the present time, Option 1 is the most affordable, as this "Do Minimum" option, as its name implies, does not involve any significant redevelopment of terminals or ferries, besides the like-for-like replacement of the existing MV *'Hendra'* and MV *'Linga'* once the end their serviceable life is reached. This do minimum option has an undiscounted capital cost of £22.4m over 30-years to 2038. It should be noted that these costs do not include optimism bias uplifts.

All other ferry options are currently grouped into capital costs of between £46.0m and £64.6m, with operational costs all around £1m pa. Options 8 and 9 may potentially reduce reliance on Vidlin, and therefore could present more affordable options than the other ferry Options.

Option 3 (Symbister extension with 2 larger ferries) and Option 5 (North Voe with 2 larger ferries) have the biggest upfront expenditure with both new ferries being bought early in the appraisal period.

The main prospects for the allocation of funding for the route rest with Shetland Islands Council through its capital programme, and revenue budget. It is noted that approximately 50 to 55% of

the current Laxo-Symbister ferry service is supported through GAE provided by the Scottish Government.

Additional funding allocations in the past have been sourced from the Scottish Government's Piers and Harbours budgets. These have supported the development of new terminals for the Northlink service, as well as new vessels and terminals for the Small Isles service on the West Coast of Scotland. The 2006-2007 programme budget stood at £7.5 million. If the Piers and Harbours budget is extended through 2008 and 2009, there may be opportunity to secure funding for the procurement of vessels or the upgrading of ferry terminals. It is noted that these budgets are now no longer available in their previous form.

It is highlighted that Shetland Islands Council will be subject to considerable competition for funding allocations from external sources.

Objective 2: To deliver a solution that is operationally sustainable
All options that safeguard the future use of the terminals and ferries meet this objective. Subject to securing sufficient revenue support, Options 3 and 5 are considered to be the most operationally sustainable and resilient to future changes because:

- they replace existing the Mainland and island terminals with facilities capable of accommodating the latest generation of vessels used within the existing fleet, maximising future fleet deployment flexibility;
- larger vessels are provided, which provide increased levels of capacity, and are fully operationally compatible with the neighbouring Yell Sound vessels;
- they would better serve the Whalsay service during times of scheduled and unscheduled vessel maintenance.

Through the provision of a single larger vessel, combined with MV *'Linga'* and the upgrading of the terminals, Options 2, 4, 8 and 9 also provide some of the benefits identified above, although these options are potentially less robust with respect to scheduled and unscheduled maintenance, and future capacity requirements. The Do minimum addresses this objective to a lesser extent with significant 'maintenance upgrade' work to the terminals to ensure they are fit for purpose for the route.

Objective 3: To at least maintain the current level of accessibility to the island
All options which do not restrain future accessibility to and from the island achieve this objective. Accessibility is maintained where service levels and frequency is maintained or improved. All options propose the existing levels of service in terms of frequency.

Options 8 and 9 may potentially perform less well against this objective if it was found that the larger ferries required to divert to Vidlin due to inclement weather as these options would not include for Vidlin to be upgraded to accommodate the larger ferries. At these times, the service would reduce to just MV *'Linga'* on the route thus reducing frequency and capacity.

The Do-Minimum option, however, would fail against this objective due to the current constraint at peak periods, and anticipated growth in future demand.

Objective 4: To reduce conflict between ferry and other harbour users
The Do-Minimum option does not address this objective.

By totally removing the Whalsay ferries from the existing harbour, options providing a new facility at North Voe perform best at this objective.

A re-designed and extended Symbister Harbour could also address congestion issues and potential conflict within the inner harbour area, although ferry movements would still continue at the harbour mouth. The outward extension performs better at addressing congestion than the inward option by removing the ferry options from the inner area of the harbour.

Objective 5: To better match supply and demand
There is evidence to suggest that demand is outstripping capacity on certain commuter sailings between Symbister and Laxo, and hence it would seem likely that the do-minimum option would fail to address this option.

The provision of two new larger vessels (options 3 and 5) perform well with respect to this objective. The provision of one larger vessel (options 2, 4, 8 and 9) also contributes to achieving this objective.

Objective 6: To ensure that the socio-economic characteristics of the island are not constrained
Performance against this objective relates closely to the ability to provide adequate levels of capacity for vehicles and foot passengers. The provision of additional vehicle carrying capacity will improve accessibility to and from the island, and thus make living on the island more attractive, as well as commuting. This favours Options 3 and 5, and then Options 2, 4, 8 and 9. The do-minimum option would tend to restrict opportunities for commuters to take vehicles on the ferry, increasing reliance upon public transport (which may not fit with shift patterns or the location of employment), lift sharing (which also suffers the same problems) or reliance upon two cars (one Mainland based, one island based).

All options featuring an outward extension of Symbister Harbour (2a, 3a and 8a), and North Voe (4, 5 and 9), through removing ferry operations from the inner harbour, potentially improve capacity for the growth of alternative harbour-based facilities. This could include activity related to the white fish fleet, shell fish vessels, or any movements linked to the local fish farm. Both options may also provide further capacity for the marina, and for visiting yachts.

It is noted that STAG requires that investment over and above that required for the ferry facility used for securing wider benefits would require to be appraised for effectiveness against alternative economic development options[21].

9.3 Implementability

Some of the options are considered to be more technically and operationally feasible than others, as discussed below.

9.3.1 Technical Appraisal

The technical feasibility of the various options can be appraised on two levels: the technical feasibility of implementing the terminals and the technical feasibility of the various vessel options proposed.

Symbister Harbour (with outward extension) poses technical risks related to construction of the breakwaters in deep water which carry risk and adds significantly to the cost. The works would require the existing north breakwater be removed which would leave the harbour exposed during construction and the north breakwater is constructed on a skerrie (large hard rock) which would most likely require explosives to remove it adding to the risks. For these reasons, this option has been ruled out.

The option of re-locating the Whalsay ferry terminal to North Voe has a number of uncertainties which will require further testing. Mathematical modelling has been undertaken to allow a better understanding of the wave action present in the Voe.

All options are considered to be technically feasible, however it is of importance that detailed wave modelling and hydrographic surveys would be required to confirm designs and final costings. [22]

[21] See section 8.8 of STAG guidance
[22] The testing required for the options could cost in the region of £100,000 and it was therefore considered prudent to undertake the analysis of the options based on data available to date and supplemented with additional mathematical modelling for North Voe; the costs for the testing have been included in the option costs.

Operational Appraisal

The operational assessment of each of the options considers whether there are any factors that might constrain the ability to operate the proposal into the future without any major additional costs. At this stage of the appraisal, all options should perform adequately in terms of their operation.

The do-minimum option may suffer operational difficulties due to high levels of constrained demand for vehicles. This similarly applies to Options 2, 4, 8 and 9 although demand will only become constrained towards the end of the appraisal period. Options 3 and 5 provide the most operationally robust ferry option, due to the larger carrying capacity, flexibility within the fleet, and efficiencies gained from fleet standardisation.

9.3.2 *Financial Appraisal*

Aspects related to affordability have been discussed under the first planning objective. At the present time, no funding is specifically allocated for any options. The RTS, which sets out SIC's transport funding context, prioritises Options over and above the Do-Minimum (Option 1) with the exception of Options which propose development of a fixed link. Therefore, Options 2, 3, 4, 5, 8 and 9 perform well under a financial appraisal.

9.3.3 *Public Acceptability Appraisal*

It is generally agreed that doing nothing is not an option as far as the current ferry users are concerned.

The face-to-face consultation undertaken revealed public opinion to be divided both over the extension of Symbister Harbour, and the development of a new facility in North Voe.

Furthermore, opinion is also split between those favouring new larger vessels, and those taking a more conservative approach. However, the over-riding message was to provide a ferry service that is operationally robust and reliable for the future.

9.4 Performance Against Government Objectives

This section summarises the appraisal of each of the options against the Government's five key objectives for transport: Environment; Safety; Economy; Integration; and Accessibility and Social Inclusion.

9.4.1 *Environment*

The environmental impacts of the options vary according to the location of the terminals.

Option 1 will not involve any additional environmental impact than at present.

Options 2 and 3, however, involve the extension of the existing terminal at Symbister Harbour. Any consequential changes to the harbour mouth may have an impact on the conditions in the harbour, and this requires to be verified by wave testing. Otherwise, the environmental impact of an extension will be slight.

Options 4, 5 and 9 will have a greater environmental impact than Options 2 and 3 because they involve the construction of a new ferry terminal, marshalling areas and breakwaters in the North Voe, which is currently undeveloped. This will have impacts on visual amenity, potential impacts on biodiversity and landscape.

Similarly, Options 8 and 9 will have a greater environmental impact because they involve the construction of a ferry terminal at a currently undeveloped site at Grunna Voe. There may be impacts on visual amenity, biodiversity and landscape.

9.4.2 Safety

Newer vessels are constructed to higher passenger safety and comfort standards. They could reduce personal injury accidents on board the ferries arising from slips and trips, but these are not currently a significant problem. Similarly, larger vessels and new terminals could reduce the incidence of slight vehicle damage, but again this is not viewed as a significant problem at present.

The do-minimum option will not reduce harbour congestion at Symbister and thus safety concerns remain with this option.

Options 4, 5 and 9, by moving ferries out of the harbour, would reduce congestion issues in the inner harbour and at the harbour mouth. Options 2a and 3a and 8a reduce congestion issues within the inner harbour.

Options 8 and 9, which propose re-locating the Mainland terminal to Grunna Voe would impose an additional 1 km of road travel. Any increase in road travel imposes an increased risk of accident.

It is noted that any newly built vessels would be built to higher "survivability" standards than existing vessels used on the route. It is also recognised that larger vessels with a greater degree of sea-worthiness are inherently safer than smaller vessels.

9.4.3 Economy

STAG considers two aspects of the Economy. The first relates to the comparison of economic costs to economic benefits. The second relates to the overall impact upon economic activity, and changes in the location of economic activity.

In all options, the economic costs (capital costs, maintenance costs and ferry operation costs) are likely to be significantly larger than any economic benefits, as measured by additional fare revenue, and savings in time. This is to be expected. The do-minimum option, with minimisation of both capital and operating costs would have the most favourable cost-benefit profile.

In terms of economic activity, our analysis has not provided evidence to strongly support one option over another. However, it is considered that options that maintain or improve accessibility to the island provide a prerequisite to maintaining economic opportunities to Whalsay residents.

The final design of the North Voe options (Options 4 and 5) may require a relocation of the existing fish farm, potentially in a northerly direction. The extent of any relocation, and the consequential impact on the fish farm's activities, will not be known until a preferred design is finalised.

9.4.4 Integration

None of the Options have an impact on integration. The proposal to develop a terminal at the North Voe site complies with local zoning requirements.

9.4.5 Accessibility and Social Inclusion

It is believed that this do-minimum option will have a negative impact because the provision of the existing vessels will limit the amount of people and vehicles that can travel to the Mainland, which is where many jobs are located. Using the congested harbour at Symbister will also hamper accessibility because a larger terminal would be required to provide the larger vessels with larger capacities necessary to address the accessibility concerns.

Following this, those options that provide the least constraint in relation to movement to and from the island, would perform best. Based upon the outcome of the ferry carryings analysis, this would suggest Options 3 and 5, followed by Options 2, 4, 8 and 9.

9.5 Outcome of Appraisal

The appraisal has indicated that each option has a range of different impacts, advantages and disadvantages.

The most important finding is the scale of investment that is required, even to maintain the existing service on a do-minimum basis. Facilitating the required improvement in the service to cope with future demands requires significant additional capital investment.

The appraisal has also highlighted the requirement for further work in confirming potential designs and costs for the Symbister Harbour and North Voe terminal options on Whalsay. The proposal of upgrading the terminal at Symbister Harbour with an outward extension has been ruled out owing to the high risk associated with this option.

The appraisal indicated that each option has a range of different impacts, advantages and disadvantages. The most important finding is the scale of investment that is required, even to maintain the existing service on a do-minimum basis. Facilitating the required improvement in the service to cope with future demands requires significant additional capital investment.

Initial findings suggest that subject to affordability considerations, two larger ferries could provide an acceptable solution, operating from Laxo (Vidlin as diversionary) to either an enlarged Symbister Harbour, or a new facility at North Voe. Advantages may be gained through the phased introduction of two larger vessels, using MV *'Linga'* as second vessel until demand on the route requires further capacity.

9.6 Appraisal Summary

The appraisal found that the following options are potentially suitable and are considered to be feasible:

- Option 1 – Do Minimum;
- Option 2 – Symbister Harbour inward extension plus one new larger ferry vessel;
- Option 3 – Symbister Harbour inward extension plus two new larger ferry vessels;
- Option 4 – New ferry terminal location at North Voe plus one new larger ferry vessel;
- Option 5 – New ferry terminal location at North Voe plus two new larger ferry vessels;
- Option 8 – Symbister Harbour inward extension plus new ferry terminal at Grunna Voe plus one new larger ferry vessel; and
- Option 9 – New ferry terminals at Grunna Voe and North Voe plus one new larger ferry vessel.

The seven options identified have been appraised in line with the study objectives, as well as in relation to their implementability, and the five national transport objectives (Environment; Safety; Economy; Integration; and Accessibility and Social Inclusion).

It is highlighted that there is a strong policy context, at both national and local level, for support to provide essential lifeline ferry services, so as to promote the social and economic viability of island communities, such as Whalsay.

However, all options, including the do-minimum, are highly dependent upon securing support from SIC and other external funding bodies. Core to the case for this funding are the benefits of sustaining a vibrant community on the Island of Whalsay, facilitated through the provision of a high quality ferry service or fixed link to the Mainland. At this stage in the development of a preferred option, this is the single most important issue that requires to be considered.

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STAG Part 2 Appraisal

10 STAG Part 2 Appraisal

10.1 Introduction

The STAG Part 2 appraisal involved a detailed assessment of each of the Options against the five national transport objectives. To inform this appraisal, a ferry user survey was conducted in October 2007. Results of the survey are summarised below and are detailed in Appendix A.

10.2 Options

The seven options arising out of the STAG Part 1 appraisal, detailed in Chapter 8, are:

- Option 1 – Do-Minimum;
- Option 2 – Symbister Harbour with inward extension, plus one new, larger ferry;
- Option 3 – Symbister Harbour with inward extension, plus two new, larger ferries;
- Option 4 – New North Voe ferry terminal, plus one new, larger ferry;
- Option 5 – New North Voe ferry terminal, plus two new, larger ferries;
- Option 8 – Grunna Voe Mainland terminal, Symbister Harbour with inward extension, plus one larger ferry vessel and retention of MV *'Linga'* (replaced on a like-for-like basis at end of operational lifespan)
- Option 9 - Grunna Voe Mainland terminal, North Voe terminal, plus one larger ferry vessel and retention of MV *'Linga'* (replaced on a like-for-like basis at end of operational lifespan)

The following chapters consider each of the options and how they perform against the following criteria:

- Environment;
- Safety;
- Economy;
- Accessibility and Social Inclusion;
- Integration; and
- Costs, Technical Considerations and Risk.

The assessment has been carried out in line with the STAG procedures. Part 2 Appraisal Summary tables have been completed and are included as Appendix F to this report.

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Environment

11 Environment

11.1 Introduction

This chapter of the STAG report presents a summary of the findings of an environmental appraisal carried out as part of the STAG Part 2 appraisal process. The following sections summarise the likely environmental effects of each option in relation to nine environmental sub-objectives identified in Transport Scotland's STAG methodology.

A full description of the environmental appraisal is set out in Appendix G, which sets out the methodologies employed, the baseline situation, mitigation and the predicted environmental effects.

11.2 Environmental Objectives

The following environmental objectives, adapted from published STAG guidelines, have been used to assess each option:

- Biodiversity;
- Landscape;
- Visual amenity;
- Cultural heritage;
- Geological features;
- Water quality, drainage and flood defence;
- Land use;
- Noise and vibration; and
- Air quality.

Each environmental objective has been 'scoped in' to the appraisal and some have been refined to ensure the appraisal is appropriate to this study.

11.3 The Options

The STAG process as a whole considers 'packages' of options. Each option consists of 3 elements:

- Vessel type;
- Terminal infrastructure on Whalsay; and
- Terminal infrastructure on the Mainland.

Each package is summarised below in Table 11.1:

Table 11.1 Packages of Options

Option	Ferry Terminal Infrastructure	Vessels
1	Do Minimum – minor upgrades to Laxo, Vidlin and Symbister	Linga Hendra
2	• Major Symbister upgrade • Laxo Upgrade • Vidlin upgrade (diversionary terminal)	Linga 31-vehicle ferry
3		Two 31-vehicle ferries
4	• North Voe – new terminal • Laxo Upgrade • Vidlin upgrade (diversionary terminal)	Linga 31-vehicle ferry
5		Two 31-vehicle ferries
8	• Major Symbister upgrade • Grunna Voe – new terminal	Linga 31-vehicle ferry
9	• North Voe – new terminal • Grunna Voe – new terminal	Linga 31-vehicle ferry

As can be seen from Table 11.1, the ferry terminal infrastructure options are repeated in more than one package e.g. the option to upgrade Laxo terminal appears in option 2,3 4 and 5. Infrastructure options for Symbister, North Voe, Grunna Voe and Vidlin also appear in two separate packages.

To avoid stating the effects of each option twice, it was necessary to appraise the individual elements separately. Each infrastructure option has therefore been considered as a discreet option. The options discussed in this chapter are set out in Table 11.2:

Table 11.2 Ferry Terminal Options

Option	Location	Description
A	Symbister	Upgrading of the existing harbour and construction of new piers within the harbour area
B	North Voe	Construction of a new pier, marshalling area and two new breakwaters
C	Grunna Voe	Construction of a new pier, access road, marshalling area and upgrading of approximately 2.5 km of the B9075 to two lanes
D	Laxo	Decommissioning of the existing pier plus construction of a new pier and breakwater
E	Vidlin	Construction of a new pier
F	Do Minimum	Minor upgrading/maintenance of Symbister, Laxo and Vidlin terminals

The differences between vessel types are only discussed in relation to air quality (see Appendix G) as no additional impacts are predicted.

11.4 Methodology

Environmental appraisals have been carried out in accordance with STAG guidelines published by Transport Scotland. Appraisal methods vary depending on the topic and on the appropriate level of detail. More detailed information regarding methods can be found in Appendix G.

STAG guidelines include worksheets which can be completed as part of the appraisal method. These have been completed and are included in at the end of Appendix G. In addition, the Appraisal Summary Tables (ASTs) in Appendix F include both quantitative and qualitative environmental information that has informed this appraisal.

The level of detail for each environmental objective varies. Biodiversity, cultural heritage, landscape and visual amenity were identified as key issues and appraisals for these objectives were carried out to a greater level of detail.

Consultation responses were received from Scottish Natural Heritage, the Scottish Environment Protection Agency, Historic Scotland, the Health and Safety Executive and Shetland Islands Council's Coastal Zone Manager. These are included in Appendix C.

The following sections present summaries of the environmental appraisals of the ferry terminal options against the nine environmental objectives listed in Section 11.2. Impacts of construction and operation phases are considered separately and potential impacts are presented using the following seven-point scale:

- Major Adverse (-3);
- Moderate Adverse (-2);
- Minor Adverse (-1);
- Neutral (0);
- Minor Positive (+1);
- Moderate Positive (+2); and
- Major Positive (+3).

Please note that only 'moderate' and 'major' effects are considered to be significant.

11.5 Summary

This section summarises the significant environmental effects of the proposals under consideration. Table 11.3 below summarises the predicted environmental effects of each option. The table is colour-coded according to the level of positive or negative impact associated with each option on each of the environmental objectives.

Environmental Impacts

Major Positive Impact (+3)	Moderate Positive Impact (+2)	Minor Positive Impact (+1)	Neutral Impact (0)	Minor Negative Impact (-1)	Moderate Negative Impact (-2)	Major Negative Impact (-3)

Table 11.3 Summary of Environmental Impacts

Option Name	**Symbister**		**North Voe**		**Grunna Voe**		**Laxo**		**Vidlin**		**Do Minimum**	
Option Ref	A		B		C		D		E		F	
Construction or Operation	C	O	C	O	C	O	C	O	C	O	C	O
Biodiversity	Min-Mod	Neu	Mod	Min-Mod	Mod	Min-Mod	Min	Neu	Min	Neu	Min	Neu
Landscape	Min	Neu	Mod-Maj	Mod	Mod	Mod	Min-Mod	Min	Min-Mod	Min	Min	Neu
Visual amenity	Min-Mod	Neu	Mod-Maj	Mod	Mod	Min-Mod	Mod	Neu-Min	Mod	Neu-Min	Neu-Min	Neu
Cultural heritage	Mod	Mod	Min	Neu	Mod	Mod	Neu	Neu	Min	Min	Min	Min
Geology	Min	Neu	Min	Neu	Min	Neu	Min	Neu	Min	Neu	Min	Neu
Water	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Neu
Land use	Min	Neu	Min	Min	Min	Neu	Min	Neu	Mod	Min	Min-Mod	Neu-Min
Noise & Vibration	Mod	Min	Mod	Min	Mod	Min	Min-Mod	Min	Mod	Min	Mod	Neu
Air Quality[23]												

C = Construction O = Operation

[23] Air quality impacts have been appraised based on the 'packages' rather than just terminal infrastructure options, therefore appraisal results do not fit into this table – see Section 10.10 for results. No significant impacts are predicted.

The remainder of this section discusses the likely significant effects of proposals for ferry terminal infrastructure. Where neutral or minor (i.e. not significant) effects have been identified, these have been omitted from this chapter; however, these are discussed in Appendix G.

The following sub-sections highlight the significant effects associated with each option. Please note that none of the options are predicted to result in significant effects on geological features, air quality or water quality, either during construction or operation. As a result these are not discussed in the remainder of this chapter.

11.5.1 *Option A - Symbister*

The majority of significant effects associated with the redevelopment of Symbister Harbour would be short-term and would occur as a result of construction activities.

Noise associated with construction activities is likely to result in significant adverse effects, with a number of properties experiencing short-term disturbance. Construction could also result in significant effects on biodiversity through disturbance to bird species in the vicinity.

The presence of construction plant and associated vehicles could result in temporary significant effects on visual amenity. Construction works and equipment may also result in significant effects on the setting of a nearby designated cultural heritage site; the Old Harbour and Pier House (a Scheduled Ancient Monument). Permanent adverse effects may also occur as a result of the reconfiguration of the new harbour area.

Mitigation measures to address noise impacts from construction could include appropriate timing to minimise night time activity and using acoustic enclosures for noisy plant, where appropriate.

11.5.2 *Option B - North Voe*

North Voe currently has an entirely undeveloped coastline and as a result, a greater number of impacts are therefore likely to occur here than at Symbister. In addition to the effects of construction, proposals for North Voe are likely to result in a number of permanent significant adverse impacts.

As with proposals for Symbister, construction has the potential to result in significant effects on biodiversity through disturbance to bird species in the vicinity. Permanent adverse impacts on bird species may also result from the introduction of regular ferry services to the voe. Furthermore, it is highly likely that otters, which are European Protected Species (EPS), would be significantly affected by construction activities. The construction of new breakwaters is likely to require the removal of an existing otter holt and may result in disturbance to another. Due to effects on otters, it is likely that works would not be permitted to proceed without a relevant licence from the Scottish Government.

The introduction of new infrastructure and ferry movements to this currently undeveloped location is likely to result in significant adverse effects on landscape character and visual amenity, throughout both the construction and operational phases.

Impacts on noise are likely to be significant, with a number of nearby receptors experiencing disturbance from construction activities. North Voe is also the only location where permanent significant effects are possible, with the permanent and regular operation of ferry services in a location which currently does not experience any similar activity.

Construction could also result in significant but temporary effects on land use, through loss of land required for construction activities.

Measures to mitigate adverse effects on otters may include pre-construction surveys to update baseline information, monitoring of potential natal holts (and other holts) before closure to avoid disruption to breeding, provision of replacement holt structures and construction site management to avoid entrapment of animals. Mitigation measures related to construction noise impacts could include appropriate timing and use of acoustic screening for noisy plant.

11.5.3 *Option C - Grunna Voe*

In addition to a new ferry terminal, proposals for Grunna Voe involve the upgrading of the B9075 between Laxo and the new terminal. The existing road is located very close to the Laxo Burn Site of Special Scientific Interest (SSSI), designated due to the presence of rare flora which is not found at any other location. There is the potential for construction to result in permanent significant adverse effects on this site.

The construction of a new terminal has the potential to disturb otters and may involve the removal of a holt. This is of particular significance due to otters' status as EPS and as discussed in relation to North Voe, works may require a licence from the Scottish Government. In addition, disturbance from the introduction of regular ferry services to this location could result in significant effects on bird species.

Grunna Voe is currently relatively undeveloped, with no buildings between Laxo and the head of the voe. The only infrastructure other than the single track B9075 is a small boat launch used for accessing nearby fish farms. Upgrading the road, constructing a new terminal and operating regular ferry services therefore has the potential to result in significant and permanent adverse effects both on landscape character and also on visual amenity.

A Scheduled Ancient Monument (SAM) is located very close to the B9075 at Laxo settlement and upgrading the road could result in adverse effects on its setting.

Finally properties located close to the B9075 are likely to experience temporary noise disturbance during road upgrading works.

Measures to mitigate adverse effects on otters may include pre-construction surveys to update baseline information, monitoring of potential natal holts (and other holts) before closure to avoid disruption to breeding, provision of replacement holt structures and construction site management to avoid entrapment of animals. Mitigation measures related to construction noise impacts could include appropriate timing and use of acoustic screening for noisy plant.

11.5.4 *Option D - Laxo*

Proposals to construct a new pier and breakwater next to the existing Laxo breakwater are not likely to generate any permanent effects. Noise impacts may be significant for neighbouring properties during construction. In addition, temporary effects on landscape character and visual amenity are likely during construction due to the presence of plant, associated vehicles and materials.

Mitigation measures to address noise impacts from construction could include appropriate timing use of acoustic enclosures.

11.5.5 *Option E - Vidlin*

As with Laxo, adverse effects of proposals to construct a new pier at Vidlin would be restricted to the construction period. Construction activities would generate temporary noise, which would be of particular significance to a nearby primary school. Temporary adverse effects on landscape character and visual amenity are also likely. Construction may also result in adverse effects on a fish farm currently located close to the existing pier.

Mitigation measures to address noise impacts from construction could include appropriate timing use of acoustic enclosures.

11.5.6 *Option F - Do Minimum*

The Do Minimum involves minor upgrades to Symbister, Laxo and Vidlin options. The only potentially significant adverse effects associated with the Do Minimum option relate to construction noise and the potential for construction to adversely affect nearby fish farms at Vidlin. Both impacts would be short term.

Mitigation measures to address noise impacts from construction could include appropriate timing use of acoustic enclosures.

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Safety

12 Safety

12.1 Introduction

The safety objective is principally concerned with the potential impacts on the number and severity of transport-related accidents. Transport-related accidents in the context of this study refer to both maritime-based and road-based accidents.

The safety objective is also concerned with any potential changes in security. Security refers to the subjective experience of the user and their perception of personal safety and security.

The following sections discuss the impacts of the proposals on the two safety sub-objectives: Accidents and Security.

12.2 Accidents

Accidents on the Whalsay-Mainland transport link are considered in two parts: road accidents and marine accidents. Each of the Options presents different implications for road accidents and marine accidents. In this section, the two are addressed separately.

12.2.1 Road Accidents (Length of Road Distance)

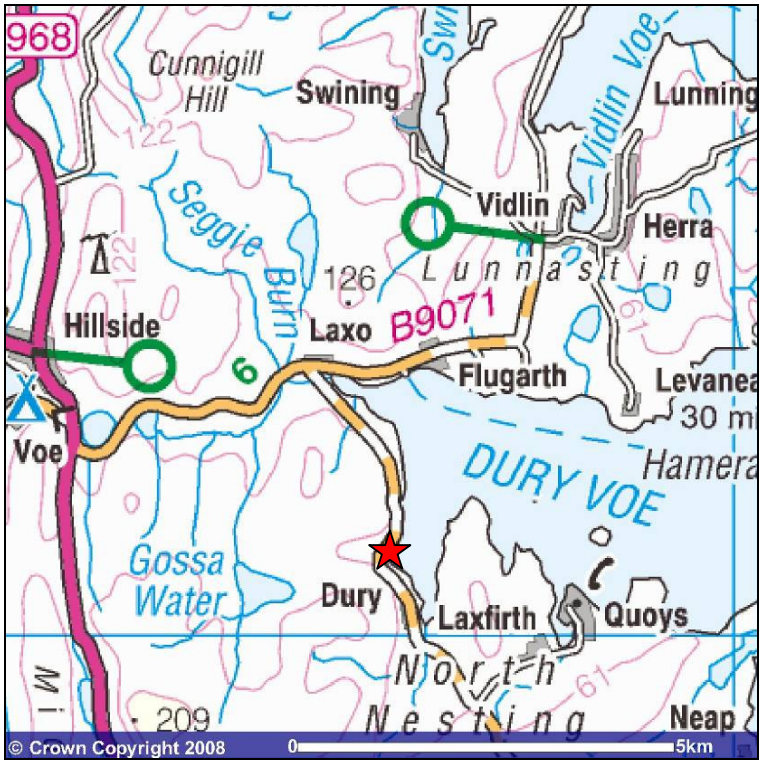
Typically, the incidence of accidents is increased as the length of the road-based trip increases and/or as the volume of traffic increases. This sub-section deals with the road accidents associated with increased length of the road journey.

It is the Mainland roads that are considered to contribute any difference (if any) between the Options with regard to road travel distance and the number of accidents expected accordingly. The roads on Whalsay are not considered to contribute to any difference in road distance for the user. There is a difference of approximately 500 metres between the existing terminal at Symbister and the proposed ferry terminal at North Voe, however, it is considered that approximately equal proportions of ferry users would see both an increase to the length of their road journey as those who would see a reduction in their journey, with no net effect. Options 8 and 9, both of which propose re-location of the Mainland terminal to Grunna Voe, are the only options which result in a change in length of the road distance users must travel.

The road that is relevant to this study is the B9071, from the junction with the A968 to the ferry terminal. Figure 12.1 shows the relevant road network. At present, there are few accidents on this five kilometres stretch of road. Between 9 January 2000 and 20 December 2006, there were five accidents[24] on the B9071 to Laxo, variously attributed to wintry road conditions, and collisions with sheep, cyclist(s) and another vehicle. On the B9075, along which vehicles will need to travel if the Grunna Voe option is developed, there were no reported accidents between 2000 and 2006, however, the extra 1,000 metres of road distance travel is expected to contribute additional accident(s) and accident costs. These are discussed in greater detail in Options 8 and 9 of this section.

[24] Shetland Islands Council, Infrastructure Services Department

Figure 12.1: B9071 to Laxo terminal



Source: Image produced from Ordnance Survey's Get-a-map service.
Image reproduced with permission of Ordnance Survey and
Ordnance Survey of Northern Ireland.
The red star ★ indicates the location of the proposed ferry terminal site at Grunna Voe.

12.2.2 *Road Accidents (Traffic Volume)*

Road accidents can be expected to increase in response to options which increase the road distance. Additionally, road accidents and their associated costs can be estimated based on the forecast increase in traffic volume. The forecast increase in traffic volume is based on a number of factors, and takes account of forecast growth in demand, vehicle capacity on the ferry vessel, and travel behaviour responses such as switching to an off-peak sailing or not taking the trip altogether based on user perceptions of 'full capacity'.

Calculating additional accidents (and accident costs) attributable to increases in traffic volume on the roads (in this case, traffic volume facilitated through increased vehicle capacity on the ferry vessel) includes consideration of both the average distance that Whalsay ferry users travel by vehicle and the types of roads that people normally travel on.

The Do-Minimum is defined with zero accidents, and all options are appraised according to performance relative to the Do-Minimum case.

Table 12.1: Summary of Accident Costs (2002 prices, 2002 values)

Capacity	Options	Accidents summed over 30 years	Accident Costs (discounted over 30 years)*
Do-Minimum (MV *'Linga'* + MV *'Hendra')*	Option 1	0 (by definition)	£0 (by definition)
One 31-vehicle ferry plus MV *'Linga'*	Options 2, 4, 8, 9	5.1	(£276,500)
Two 31-vehicle ferries	Options 3, 5	5.6	(£299,500)
Additional accident costs imposed due to additional road length to Grunna Voe	Options 8, 9	0.8	(£43,500)

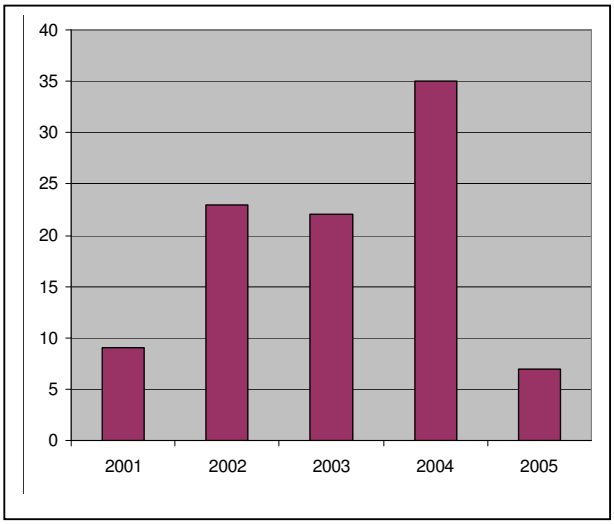
*Discount Rate of 3.5%

12.2.3 *Marine Incidents*

Marine incidents include accidents on the ferry vessels themselves (including mishaps between vehicles), accident or conflict between the ferry vessel and other marine traffic and/or the pier, as well as 'near miss' incidents.

Accident data from 2001 and 2005 indicate a total of 96 incidents with Shetland Island Council ferries. These include incidents where there was a 'potential conflict' with another marine vessel. With a total of approximately 34,100 sailings every year, this represents an incident rate of approximately 16 per year or about one incident for every 2,100 sailings. Figure 12.2 shows the number of incidents per year.

Figure 12.2: Number of incidents involving Shetland Island Council ferries (2001-2005)



Most of these incidents related to damage to cargo on the ferry, for example a vehicle colliding with a ramp. The other major cause of incidents related to equipment failure. Approximately 10% of incidents between 2001 and 2005 (a total of 10 incidents) were attributed to manoeuvring issues and 5% were attributed to navigational issues. Figure 12.3 shows the number of incidents by type over the period between 2001 and 2005.

One of the problems and opportunities identified during stakeholder consultation during the STAG Part 1 study was that of congestion in Symbister Harbour and the subsequent potential for incidents. Data collected between 2001 and 2005 indicate that a total of five incidents occurred relating to manoeuvring or navigational issues on the MV *'Thora*[25], MV *'Linga'* and MV *'Hendra'*.

[25] *MV Thora* was used on the Whalsay-Mainland route until 2002, when *MV Linga* came into operation.

Figure 12.3: Total Number of Incidents by Type, Shetland Island Council Ferries, between 2001 and 2005.

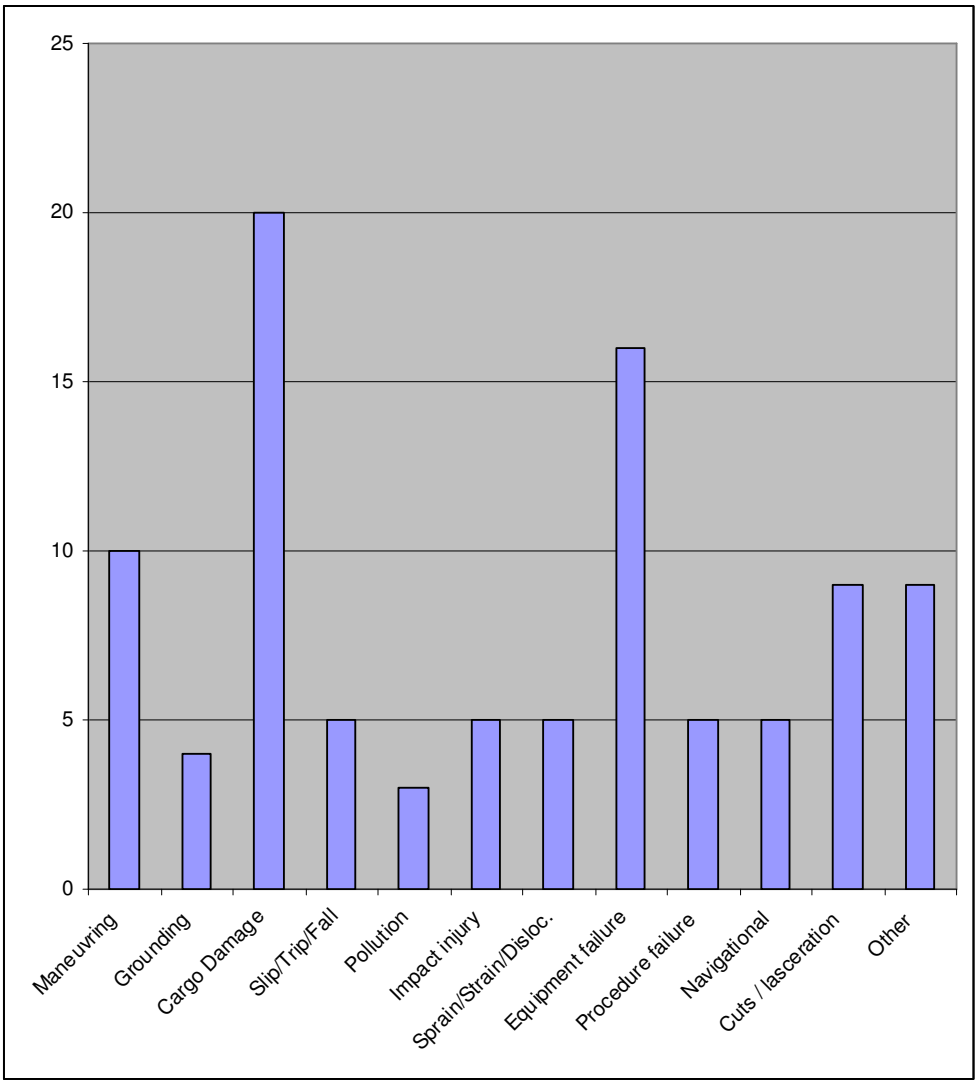


Table 12.2 provides a sample of the types of incidents that have occurred in Symbister Harbour.

Table 12.2: Summary of navigational and manoeuvring incidents for ferry vessels that use Symbister Harbour

Year	Vessel	Incident Type	Details
2002	MV *'Linga'*	Manoeuvring	Collision with pier
2002	MV *'Linga'*	Manoeuvring	Collision with pier
2003	MV *'Linga'*	Manoeuvring	Near collision in Symbister

The following sections detail safety aspects associated with each of the options.

Option 1 – Do-Minimum

In the Do-Minimum option, dangers to ferry passengers are mitigated through the monitoring and eventual replacement of the existing ferry vessels. Safety in the Do-Minimum option is affected by the growth in volume of traffic going to and coming from the ferry terminals. Monthly passenger car equivalent units have been steadily increasing on the Whalsay-Mainland route from 2000. The limited capacity of ferry vessels in the Do-minimum option will be limited to the extent to which the incidence of accidents are expected to increase as a result of increased

traffic volume. It is noted that whilst five accidents have been reported on the B9071 between 2000 and 2006, accident costs within the Do-Minimum case are, by definition, considered to be zero. All other options and estimated accident costs are calculated relative to the Do-Minimum case.

With regard to marine safety, the Do-Minimum option does nothing to mitigate the existing risk of incident as a result of congestion and marine traffic in Symbister Harbour.

The Do-Minimum option is considered to include the road network from the A970 to Laxo, and the 1,000 metre stretch of road from Laxo to the ferry terminal. Between 9 January 2000 and 20 December 2006, there were six accidents on the B9071 between the A970 and the Laxo ferry terminal.

Option 2 – Symbister Harbour with (inward) extension, plus one new, larger ferry

Safety in Option 2 is affected by the growth in volume of traffic going to and coming from the ferry terminals. Monthly passenger car equivalent units have been steadily increasing on the Whalsay-Mainland route from 2000 and before. This, coupled with the extra capacity in the newer, larger ferry vessel would facilitate growth in traffic going to and coming from ferry terminals.

Road accident costs due to increased road distance are assumed to remain unchanged from the Do-Minimum case (i.e. £0) as road travel distance is unaffected.

With regard to marine safety, the extension proposed in Option 2 is considered to allow greater ease of marine movement in Symbister Harbour thereby reducing the risk of accident although congestion would still exist at the harbour mouth and at the inner harbour area.

The change in accident **costs** for Option 2 relative to the Do-Minimum case, discounted over a 30-year period to 2002 prices and values, is estimated to be £276,000.

Option 3 – Symbister Harbour with (inward) extension, plus two new, larger ferries

As with Option 2, safety is further improved with the addition of two new ferry vessels that conform to European standard design and stability requirements. With no new road infrastructure associated with this option, the incidence of road-based accidents is expected to remain unchanged. Safety in Option 3 is affected by the growth in volume of traffic going to and coming from the ferry terminals. Monthly passenger car equivalent units have been steadily increasing on the Whalsay-Mainland route from 2000 and before. This, coupled with the extra capacity in the newer, larger ferry vessels would further facilitate growth in traffic going to and coming from ferry terminals.

Road accident costs are assumed to remain unchanged from the Do-Minimum case (i.e. £0) as road travel distance is unaffected.

With regard to marine safety, the extension proposed in Option 3 is considered to allow greater ease of marine movement in Symbister Harbour thereby reducing the risk of accident; congestion would still occur at the harbour mouth and at the inner harbour area.

The change in accident **costs** for Option 3 relative to the Do-Minimum case, discounted over a 30-year period to 2002 prices and values, is estimated to be £300,000.

Option 4 – North Voe ferry terminal plus one new, larger ferry

With regard to maritime safety and as with previous options, safety is improved with the addition of a new, larger ferry vessel that conforms to European standards for design and stability requirements.

The re-location of the island ferry terminal from Symbister Harbour to North Voe is associated with approximately 500m (approximately 1/3 mile) change in land distance. Depending on where passengers are travelling to and from, re-location of the ferry terminal is not expected to impact on the overall distance of road-based travel or the incidence of road-based accidents. Some residents may require travelling an additional 500 metres whilst others will have their

journey reduced by the same amount. The change in accident costs are therefore considered to be zero.

Re-location of the ferry terminal to North Voe would reduce the likelihood of conflict between ferry vessels and other marine traffic. The North Voe harbour offers more space for marine traffic movement and there would not be a space-constrained entrance as there presently is in Symbister Harbour.

Safety in Option 4, as with Option 2, is affected by the growth in volume of traffic going to and coming from the ferry terminals. Monthly passenger car equivalent units have been steadily increasing on the Whalsay-Mainland route from 2000. This, coupled with the extra capacity in the new, larger ferry vessel would facilitate growth in traffic going to and coming from ferry terminals.

The change in accident **costs** for Option 4 relative to the Do-minimum case, discounted over a 30-year period to 2002 prices and values, is estimated to be £276,000.

Option 5 – North Voe ferry terminal plus two new, larger ferries

The re-location of the island ferry terminal from Symbister Harbour to North Voe is associated with approximately 500m (approximately 1/3 mile) change in distance. Depending on where passengers are travelling to and from, re-location of the ferry terminal is not expected to impact on the overall distance of road-based travel or the incidence of road-based accidents. Some residents may require travelling an additional 500 metres whilst others will have their journey reduced by the same amount. Accident costs are therefore considered to be zero.

Re-location of the ferry terminal to North Voe would reduce the likelihood of conflict between ferry vessels and other marine traffic as the existing marina is retained at Symbister Harbour. The North Voe harbour offers more space for marine traffic movement and there would not be a space-constrained entrance as there presently is in Symbister Harbour.

Safety in Option 5, as with Option 3, is affected by the growth in volume of traffic going to and coming from the ferry terminals. Monthly passenger car equivalent units have been steadily increasing on the Whalsay-Mainland route from 2000. This, coupled with the extra capacity in the new, larger ferry vessels would further facilitate growth in traffic going to and coming from ferry terminals.

The change in accident **costs** for Option 5 relative to the Do-Minimum case, discounted over a 30-year period to 2002 prices and values, is estimated to be £300,000.

Option 8 - Grunna Voe Mainland terminal, Symbister Harbour with extension, plus one larger ferry vessel and retention of MV *'Linga' (replaced on a like-for-like basis at end of operational lifespan)*

The road journey to the proposed Grunna Voe site from the B970 junction would require an additional 1,000 m to the Do-Minimum option of retaining the terminal at Laxo. Over the 30-year period to 2038, this would involve an estimated 0.59 accidents at an estimated discounted cost of £50,800.

With regard to marine safety, the proposed site at Grunna Voe is not expected to result in any changes relative to the Do-Minimum. Although fish farms are located at the mouth of the Grunna Voe harbour, these are not expected to interfere with the safety of ferry operations. Option 8 proposes redevelopment of Symbister Harbour with an inward extension. As with Options 2 and 3, the inward extension is assumed to confer an overall improvement in marine safety by providing an additional pier towards the inner portion of the harbour.

The change in accident **costs** for Option 8 relative to the Do-Minimum case, discounted over a 30-year period to 2002 prices and values, are estimated to be £291,000.

Option 9 - Grunna Voe Mainland terminal, North Voe terminal, plus one larger ferry vessel and retention of MV *'Linga' (replaced on a like-for-like basis at end of operational lifespan)*

The road journey to the proposed Grunna Voe site from the B970 junction would require an additional 1,000 m travel relative to the Do-Minimum option of retaining the terminal at Laxo. Over the 30-year period to 2038, this would involve an estimated 0.59 accidents at an estimated discounted cost of £50,800.

With regard to marine safety, the proposed site at Grunna Voe is not expected to result in any changes relative to the Do-Minimum. Although fish farms are located at the mouth of the Grunna Voe harbour, these are not expected to interfere with the safety of ferry operations. Option 9 proposes relocation of the Whalsay terminal to North Voe, and as with Options 4 and 5, it is assumed that overall improvement in marine safety will be conferred through the separation of the marina and the ferry terminal.

The change in accident **costs** for Option 9 relative to the Do-Minimum case, discounted over a 30-year period to 2002 prices and values, is estimated to be £291,000.

12.3 Security

Security is a required consideration of a STAG appraisal and considers the impacts of a proposal on pedestrians, cyclists, public transport users, car users, and in this case as well, ferry users. Appraising security is largely a qualitative process and subject to user perceptions. Therefore, an appraisal must consider not only potential changes in *actual* security, but changes in *perceived* security as well.

Aspects or elements that might impact on security would include those related to changes in lighting, CCTV cameras, manning of booths (or in this case, ferries), presence of other travellers, as well as the perceived safety of the transport link (e.g. ferry vessels and terminals). These are just a few examples.

Using the Do-Minimum option as a base case scenario, none of the options are expected to generate any changes in security. Security has not been identified as an issue either on the Mainland or on Whalsay.

12.4 Summary

Table 12.3 summarises the safety and security impacts associated with each of the Options.

Table 12.3: Summary of accident costs

	Accident Costs over discounted to 2002	Security Impacts
Option 1 (Do-Minimum)	£0	No impact
Option 2	£276,500	No impact
Option 3	£299,500	No impact
Option 4	£276,500	No impact
Option 5	£299,500	No impact
Option 8	£320,000	No impact
Option 9	£320,000	No impact

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Economy

13 Economy

13.1 Introduction

The economy objective is principally concerned with economic impacts of a proposed scheme, including cost-benefit analysis and economic activity and location impacts (EALI) that may affect the local and/or national economy.

13.2 Transport Economic Efficiency

Transport Economic Efficiency (TEE) appraisal examines the costs and benefits for users and operators. The TEE appraisal considers the number of existing users as well as forecast numbers of future users. This following sections review recent trends in the number of users and forecast passengers and vehicles in the years through to 2038.

13.2.1 *Traffic Growth*

Ro-ro ferry services to Whalsay were introduced in 1975. Reliable statistics for passenger and vehicle carryings are available from 2000, the year that data collection for both passengers and vehicles was upgraded for every sailing[26].

13.2.2 *Passengers*

There has been an increase in the annual number of passengers travelling between Whalsay and the Mainland since 2003. The most dramatic increase occurred in 2003. Table 13.1 shows the total annual number of passengers since 2000.

Table 13.1: Annual Passenger Carryings on the Laxo-Symbister Route from 2000 to 2007

Year	Total Annual Passengers	% change from previous year
2000	145,882	n/a
2001	138,022	-5.4
2002	130,512	-5.4
2003	153,828	17.9
2004	157,375	2.3
2005	166,016	5.5

Source: Analysis of Carrying and Performance data on Inter-Island Ferry Services 1998 to 2005 (ZetTrans)

13.2.3 *Passenger Car Units*

Vehicle deck utilisation increased between 2000 and 2005, particularly on the commuter sailings[27]. Table 13.2 shows the number of PCUs and the vehicle deck utilisation on the Whalsay ferry vessels between 2000 and 2005.

[26] Analysis of Carryings and Performance data on Inter-Island Ferry Services 1998-2005, ZetTrans: Zetland Transport Partnership (prepared by BM Consulting), March 2007, and from Shetland Island Council fare box figures

[27] Commuter Sailings are defined as ex Symbister 0630, 0700, 0750, 0825 and ex Laxo 1700, 1750, 1830, 2030.

Table 13.2: PCUs and Vehicle Deck Utilisation on the Laxo-Symbister route, 2000-2005.

	PCU	Vehicle Deck Utilisation (Commuter Sailings)	Vehicle Deck Utilisation (average)
2000	71,807	58.0%	46%
2001	68,998	59.7%	44%
2002	66,242	58.3%	46%
2003	77,491	66.5%	48%
2004	80,076	69.6%	48%
2005	83,589	64.4%	48%

In 2000, the average deck utilisation on commuter sailings was 58% and by 2005, this had increased to 64.4%. Much of this increase appears to have occurred between 2002 and 2003, when a larger-capacity vessel (MV *'Linga')* was introduced. Average vehicle deck utilisation on commuter sailings jumped from 58% to 69.6% in two years before decreasing again in 2005 due to the introduction of a larger vessel. The table shows that utilisation on the commuter sailings has been approaching 70% and the Ferry User Survey undertaken in October 2007 (see Appendix A) indicated that ferry users perceived the ferry vehicle decks to be at capacity during commuter sailings.

Together with the overall average vehicle deck utilisation, these figures suggest that the introduction of additional capacity on MV *'Linga'* in 2002 has primarily served to accommodate commuters with vehicles. This interpretation broadly aligns with anecdotal evidence that as employment opportunities on the island are decreasing, the proportion of Whalsay residents who commute to the Mainland for work has been increasing.

The figures in Table 13.2 could be interpreted to suggest that there remains spare capacity on the ferry vehicle decks. Full capacity is often considered to be reached when the vehicle decks are at an average of 75% of designated capacity, owing to variable-sized vehicles and issues with fitting the vehicles on the ferry vehicle deck. The uncertainty of securing a space on the ferry thus imposes a strain on the journey for the ferry user as the average vehicle deck capacity reaches 75%. This helps to explain why the vehicle deck utilisation on commuter sailings has been identified as a stakeholder concern whilst vehicle deck utilisation figures would otherwise indicate spare capacity on commuter sailings.

13.2.4 Traffic and Passenger Growth Forecasts

The growth in the number of vehicles and the number of passengers was forecast in order to estimate the benefits and expected revenue associated with each of the options. Vehicles and passengers are forecast separately owing to the different capacity constraints for vehicles and passengers.

Growth in the annual number of vehicles is forecast to the year 2038, and is based on reducing rates of growth. Passenger forecasts were based on current ratio of vehicles to passengers as determined by the Ferry User Survey. Assumptions and calculations for forecasting future passenger and vehicle volumes are detailed in Appendix H.

Assumed growth rates are listed in Table 13.3. These rates were used to calculate baseline figures for unconstrained vehicle demand on the Whalsay-Mainland route.

Table 13.3: Assumed Vehicle Growth Rates for commuter sailings

Period	Growth Rate
2004-2008	7%
2009-2013	5%
2014-2038	3%

The growth in the number of vehicles on the ferries is considered to be constrained at some point in the future, the year of which depending on the combined capacity of the ferry vessels. To forecast the number of vehicles that would use the ferry service, the forecast (unconstrained) demand per year was used up to the year that the demand met or exceeded capacity on the ferry. Thereafter up to 2038, the number of vehicles is forecast to remain the same with the ferry vessel at full capacity.

Full capacity is not considered 100% capacity. 100% capacity is the theoretical maximum number of car equivalent units that should be able to fit on the ferry vessel's vehicle deck. In reality, utilisation of the vehicle deck rarely reaches 100%. Size of vehicles and their placement on the vehicle deck can affect the number of vehicles that can be accommodated on the ferry vessel. Also, vehicles carrying dangerous goods require standards of clearance that effectively occupy space on the vehicle deck. From a ferry user standpoint, the ferry reaches 'full capacity' at anywhere from 70% to 90%. At these utilisation levels, the ferry user deems the vessel 'full' and switches to either an alternative mode of transport (e.g. car passenger) or switches to an alternative sailing.

The Ferry User Survey conducted in October 2007 confirms the perceptions of vehicle deck utilisation levels approaching, but not reaching, full capacity. The primary stakeholder concern regarding the Whalsay-Mainland ferry service related to capacity issues on commuter sailings. Over the course of the survey[28], no vehicles were left behind on any of the sailings sampled whilst 38% of pedestrians and car passengers who indicated that a vehicle was available to them chose not to use their vehicle as a result of capacity issues on the ferry.

Moreover, there is a 'tidal flow' issue with the ferry service. During commuter sailings, the vehicle deck is nearly full or effectively full sailing in one direction, but under half-occupied on the return sailing. Therefore, the average vehicle deck utilisation rate over all sailings does not provide an accurate picture, particularly for commuter sailings.

Sensitivity tests were run to determine the most likely utilisation levels at which the ferry vessels would be deemed 'full capacity' by ferry users, and this was found to be 75%. At this rate, the ferry vessels are deemed to reach full capacity at an earlier point in time, assuming vehicle and passenger demand continues to grow on an annual basis. Using 75% to estimate full capacity and assuming the growth rates listed in Table 13.3, Table 13.4 shows the year at which each of the options is forecast to reach 'full capacity'.

Table 13.4: Annual Vehicle Capacity and Forecast Year of Maximum Capacity Reached

Options	Annual Capacity in PCU's*	Year at which vehicle demand reaches capacity (based on 75% utilisation)
Do-Minimum (MV *'Linga'* + MV *'Hendra'*)	198,536	2007
Options 2,4, 8 and 9 (MV *'Linga'* + One 31-vehicle ferry	320,788	2017
Options 3 and 5 (*Two* 31-vehicle ferries)	393,328	2032

*Passenger Car Units.

13.2.5 *Vehicle Operating Costs*

Vehicle operating costs (VOC) refer to any additional costs conferred to the user compared with the Do-Minimum Case. Additional costs may be incurred when an option proposes lengthening the distance of road a user must travel, as the proposal to re-locate the Mainland terminal at Grunna Voe. User costs relate to both fuel consumption and non-fuel costs, such as wear and tear, maintenance, and so on. VOC are also considered to increase in cases where there is a forecast increase in traffic volume. User costs are estimated using standard methodology as outlined in the WebTag manual.

The proposed re-location of Whalsay terminal from Symbister Harbour to North Voe, as proposed in Options 4 and 5, is not considered to impact on travel distance for the user. The proposed North Voe site is less than 500m from the existing terminal at Symbister Harbour and

[28] Results from the Ferry User Survey are detailed in Appendix A.

re-location of the terminal would result in reduced travel distances for some residents and increased travel distances for others.

Options 8 and 9 propose re-locating the Mainland terminal at Grunna Voe thereby introducing an additional 1,000 metres of road travel to the user.

Table 13.6 summarises the user costs vehicle operating costs for each of the Options.

Table 13.6: Vehicle Operating Costs (discounted over 30-years to 2002 prices, 2002 values)

Proposed	Costs* (£ 000's)
Option 1 - Do-Minimum	(£0)
Option 2, Option 4	(£90)
Option 3 and Option 5	(£153)
Option 8 and Option 9	(£217)

*Includes fuel, non-fuel costs

Calculations and assumptions for the estimation of VOC are provided in Appendix H of this report.

13.2.6 *Journey Time Savings*

Options may present a net benefit to users if they provide savings with regard to travel time. Conversely, journey time costs may be incurred if an Option introduces additional travel distances and travel times to the journey. Travel time in the context of the Whalsay-Mainland link can be influenced by a number of factors: road distance, ferry crossing distance, ferry speed, and berthing and disembarking times. Time savings are also related to capacity issues when, for example, a vehicle is forced to wait for the next sailing if their first choice sailing is full. This is more difficult to quantify as perceptions of 'full capacity' influence travel behaviour decisions.

Table 13.7 lists the travel time savings associated with each of the options.

Table 13.7: Total Travel Time Benefits from 2007 to 2038 (discounted to 2002 prices, 2002 values)

Proposal	Road Travel	Berthing and Disembarking (min per 31-vehicle ferry sailing)	Non-upgraded Vidlin Diversion Costs (£000s)*	Total Savings** (£ 000's)
Option 1 - Do minimum w Vidlin		0	n/a	£0
Option 2 - Symbister + 1 31-vehicle ferry w Vidlin		4	n/a	£1,783
Option 3 - Symbister + 2 31-vehicle ferries w Vidlin		4	n/a	£2,362
Option 4 - North Voe + 1 31-vehicle ferry w Vidlin		4	n/a	£1,783
Option 5 - North Voe + 2 31-vehicle ferries w Vidlin		4	n/a	£2,362
Option 8 - Grunna Voe + Symbister	1,000 metres	4	(£556)	£225
Option 9 - Grunna Voe + North Voe	1,000 metres	4	(£556)	£225

* Grunna Voe options do not include for the upgrade at Vidlin that would allow the larger ferries to berth. For this reason when diversions were taking place due to weather the service would be reduced to 1 vessel rather than 2; the time impact to this has been calculated and is represented here.

**Calculated using WebTag methodology

As Table 13.7 shows, Options 8 and 9 provide reduced travel time benefits, owing to the additional road distance introduced to the ferry user. All of the Options confer some benefit in terms of travel time benefits as they introduce greater capacity on the transport link. Options 3 and 5, which propose the introduction of two new 31-vehicle capacity ferry vessels, are estimated to provide the greatest benefit in terms of travel time benefits.

Time savings (or costs) associated with reduced (or additional) road distance is an estimate based on assumed travel speeds. In this case, travel speed is assumed to average 80 kph (50 mph). Total cost savings were estimated based on the 2005 data for total number of passenger carryings. Total annual passenger carryings has grown since then, and the total time cost savings are therefore considered a conservative estimate. The 'Rule of Half' has been applied to new trips in line with WebTag.

With regard to ferry crossing time, the proposal to deploy one or two 31-vehicle ferries would theoretically reduce the ferry journey crossing time. The travel time saving per sailing is considered to be four minutes, based on the performance of the 31-vehicle ferry vessels operating on Yell Sound.

For Options which propose deploying one 31-vehilce vessel on the route, the time cost savings are considered to be conferred on 60% of the sailings[29]. Similarly, for Options which propose deploying two 31-vehilce vessels, time savings are considered to be conferred on all sailings.

Calculations and assumptions are detailed in Appendix H of this report.

The transport economic efficiency figures are summarised in Table 13.9.

13.3 Economic Activity and Location Impacts

13.3.1 Overview of Approach

STAG requires an assessment of the economic activity and location impacts (EALI) of the proposed scheme(s). This assessment is undertaken at the local or regional level and at the wider Scottish level. The appraisal seeks to quantify the impacts in terms of employment gains and losses as well as income/GDP.

The approach adopted reflects the STAG guidance in devising a means of understanding:

"The potential behavioural responses of different 'sectors' of economic activity…The approach suggested involves dividing or segmenting the economy into 'sectors' and considering each of these in turn. Once a usable segmentation has been selected, this approach involves investigating how the economic factors relevant to each sector might be affected by, and respond to, the changes in costs or accessibility brought about by the transport proposals under analysis."

The following sections appraise the Options with regard to economic activity and location impacts.

13.3.2 Option Impacts

The link between transport investment and economic performance has been widely debated, and depends heavily upon local circumstances. Whilst there is a theoretical basis for assuming that transport improvements will lead to improved economic competitiveness, empirical evidence is less clear. At best, it appears that transport investment is one of a number of issues affecting economic performance, but is by no means the most important or critical factor. At worst, there is a risk that improved transport infrastructure may open up the local economy to more competition, and thus cause a net disbenefit to the local economy.

Overall, it is considered that each of the options help to support local economic development opportunities on Whalsay through maintenance or improvement of the transport link between

[29] In Options which propose one larger ferry, it is assumed that the larger ferry would operate as the primary ferry vessel on the route.

Whalsay and the Mainland. In addition, this impact may have wider economic impacts for Shetland.

13.3.3 *Developments Likely to Benefit from Scheme Options*

The Whalsay-Mainland transport link has potential to open up development opportunities on Whalsay. Relative to the Do-Minimum, each of the options opens up opportunity to accommodate an increased number of fishing vessels in Symbister Harbour as well as an increase in associated fishing industry related activities.

Presently, much of the economic activity at Symbister Harbour is related to the fishing and aquaculture industries, including:

- 17 commercial vessels (All are crewed by residents on Whalsay;
  - 7 pelagic vessels (December to March, 90 jobs supported);
  - 7 white fish vessels (in Symbister once or twice a week, 50 jobs supported);
  - 4 scallop vessels;
  - 1 'salmon coaster'
- Fishing Net repairs;
- Fish processing plant (60 jobs)
- Small engineering works and mechanical repairs (2 jobs).

The proposed changes within all the options (with the exception of the Do-Minimum) would potentially allow for an increase in the number of vessels that Symbister Harbour could accommodate. Re-locating the ferry terminal to North Voe, as proposed in Option 4, Option 5 and Option 9, could open up additional berthing space in Symbister Harbour.

It is unclear at this point whether extra berthing space in Symbister would necessarily facilitate greater economic activity on Whalsay. The fishing vessels may not necessarily provide additional employment for Whalsay residents or greater opportunity for fish processing on Whalsay. Anecdotal evidence suggests that some fishing vessels base their activities in Lerwick but use the berthing facilities on Whalsay as it is cheaper to lay up there than it would be at Lerwick. As a result, there remains uncertainty regarding the extent to which extra berthing space offered in varying degrees by each of the options would impact on economic activity and developments on Whalsay.

The introduction of extra capacity on the ferry service has been shown elsewhere on Shetland to lead to easier maintenance of island businesses. For example, when extra capacity was introduced on the Toft-Ulsta route (connecting the island of Yell with the Mainland), there was indication that fish processing businesses benefited from the assurance that crucially-timed deliveries to Lerwick would not be impeded as a result of capacity issues on the service. It is considered that the island of Whalsay could similarly benefit from capacity improvements.

With regard to the Mainland, the development opportunities or impacts associated with a Whalsay-Mainland transport link are considered to be negligible.

13.3.4 *Employment Opportunities*

Employment on Whalsay is primarily related to the fishing industry in the area, which provides approximately 200 jobs (part-time, seasonal and full-time), or about half of all jobs on Whalsay.

Other employment opportunities are provided through some crofting activities, the primary and secondary school, and the local store.

Capacity improvements on the Whalsay-Mainland link, as proposed in all Options other than the Do-Minimum may open up opportunity to increase the number of job opportunities on Whalsay. There may be opportunity to open up tourist opportunities, particularly with regard to the golf course and with associated tourist services and facilities.

Alternatively, improved capacity may also result in residents seeking job opportunities elsewhere in Shetland, resulting in a reduced labour market for businesses or other organisations seeking to expand their activities on Whalsay.

With regard to options which propose changing the location of the existing ferry terminal sites, such as to Grunna Voe or to North Voe, these are considered to have negligible impacts on employment opportunities.

13.4 Summary

An analysis of the costs and benefits for users and operators of the Laxo-Symbister ferry service with regard to each of the Options indicate user costs are generally higher for those options which facilitate greater traffic volume (due to increased trips and the associated vehicle operating costs) and for those which lengthen the road distance portion of the journey (i.e. Options 8, and 9). Lower user costs are estimated for Options 3 and 4. Conversely, the journey time savings are considerably greater for Options which propose the introduction of two 31-vehicle ferry vessels (Options 3 and 5), but are considerably reduced for Options which present additional road distance to the journey (Options 8 and 9).

With regard to the economic activity and location impacts, each of the Options other than the Do-Minimum are expected to facilitate the economic sustainability of the island of Whalsay through maintenance and improvements to the transport link. The island of Whalsay is currently one of the most deprived communities in Scotland in terms of geographic access, and it would seem that much of the economic activity that takes place on Whalsay is crucially supported through the maintenance of the transport link. Additionally, there is potential for positive economic impacts associated with extra berthing space at Symbister marina, either through the addition of an inward extension or by relocation of the ferry terminal to North Voe.

Table 13.9: Summary of Economic Impacts

	Journey Time Costs (£000s)	Vehicle Operating Costs (£000s)	Economic and Location Impacts
Option 1 - Do minimum w Vidlin	£0	(£0)	No Impact
Option 2 - Symbister + 1 31-vehicle ferry w Vidlin	£1,783	(£128)	Positive impact associated with greater capacity on the transport link. Positive impact associated with Potential positive impact associated with additional berthing space at Symbister marina
Option 3 - Symbister + 2 31-vehicle ferries w Vidlin	£2,362	(£163)	Positive impact associated with greater capacity on the transport link. Potential positive impact associated with additional berthing space at Symbister marina.
Option 4 - North Voe + 1 31-vehicle ferry w Vidlin	£1,783	(£128)	Positive impact associated with greater capacity on the transport link. Potential positive impact associated with additional berthing space at Symbister marina
Option 5 - North Voe + 2 31-vehicle ferries w Vidlin	£2,362	(£163)	Positive impact associated with greater capacity on the transport link. Potential positive impact associated with additional berthing space at Symbister marina
Option 8 - Grunna Voe + Symbister	£225	(£217)	Positive impact associated with greater capacity on the transport link. Potential positive impact associated with additional berthing space at Symbister marina
Option 9 - Grunna Voe + North Voe	£225	(£217)	Positive impact associated with greater capacity on the transport link. Potential positive impact associated with additional berthing space at Symbister marina

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Accessibility and Social Inclusion

14 Accessibility and Social Inclusion

14.1 Introduction

The Accessibility and Social Inclusion objective is principally concerned with *community accessibility* which includes access to local services, and *comparative accessibility* which considers the distribution of transport access benefits by people, group and by location.

This chapter provides an overview of social inclusion with regard to Whalsay and provides an appraisal of each of the Options with regard to each of the two sub-objectives, community accessibility and comparative accessibility.

14.2 Social Inclusion

It has been known for some time that there is a relationship between transport and social inclusion[30]. The Scottish Indices of Multiple Deprivation (SIMD) provides an overview of aspects of social inclusion or deprivation. SIMD measure levels of deprivation through means of five key indicators of deprivation: access, education, employment, health and income.

Table 14.1 details the ranking of Symbister and the rest of Whalsay (and Skerries) with regard to various measures of deprivation.

Table 14.1 – SIMD Rank 2006

	Symbister		Rest of Whalsay and Skerries *	
SIMD Domain	**SIMD Rank (out of 6,505)**	**Quintile (1 = Most Deprived, 5 = Least Deprived)**	**SIMD Rank (out of 6,505)**	**Quintile (1 = Most Deprived, 5 = Least Deprived)**
Overall SIMD Rank	4,946	4	3,649	3
Income Domain Rank	4,827	4	4,833	4
Employment Domain Rank	6,205	5	5,473	5
Health Domain Rank	6,239	5	6,449	5
Education Rank	3,318	3	2,718	3
Geographic Access Rank	767	1	7	1
Crime Rank	5,598	5	5,748	5

Source: Scottish Executive SIMD 2006; * It should be noted that Skerries is very remote and will have a bearing on these figures

With regard to employment, income, health and crime, Symbister and the rest of Whalsay rank very high relative to the 6,505 datazones in the rest of Shetland and Scotland.

With regard to geographic access, Symbister and the rest of Whalsay rank very low relative to the rest of Scotland. It is anticipated that Symbister and the rest of Whalsay will seek to benefit from the transport options proposed, primarily by virtue of increased capacity and service levels (in all options except the Do-Minimum) and overall improvement of geographic access.

[30] "*Running on Empty: Transport, social exclusion and environmental justice*", Dr. Karen Lukas, Policy Press, 2004.

The following sections set out the potential impacts of each option on the two sub-objectives: community accessibility and comparative accessibility.

14.3 Community Accessibility

Community accessibility is considered to increase where there is an increase in the public transport network coverage and/or an increase in local accessibility through improved walking and cycling opportunities. Conversely, community accessibility is considered to decrease where there is a reduction in the public transport network coverage and/or there are any barriers introduced that would hinder walking and cycling opportunities.

14.3.1 Public Transport Network Coverage

At present, there is no timetabled public transport service on Whalsay. Minibuses are, however, available for school runs and for private hire. Both vehicles are Council-owned. On the Mainland side, there is timetabled bus service from Vidlin and Laxo to Lerwick[31], operating daily from Monday through Saturday. The service timetable is shown in Table 14.2.

Table 14.2: Timetabled Public Transport between Vidlin/Laxo and Lerwick

To Lerwick	**Time**	**Time**
Depart Vidlin	08:05	17:50
Depart Laxo	08:20	17:45
To Vidlin/Laxo		
Depart Lerwick	07:25	17:05

With regards to public transport network coverage, none of the options is expected to generate a change in the coverage of public transport. The ferry options either retain the Mainland ferry terminal at Laxo or relocate the terminal to Grunna Voe, with the existing public transport service serving the ferry terminal at Laxo (and Vidlin).

The impact of diverting the bus service to Grunna Voe would require an additional two kilometres (1,000 metres each way) on the length of the journey for residents travelling from Vidlin. The number of residents boarding the bus at Vidlin is estimated to be low. In 2001, there were 214 residents in the Delting East and Lunnasting Census Ward where Vidlin is located, of which 8% (or approximately 17 individuals) indicated travel to their usual place of work by bus or minibus[32]. The overall impact of diverting the bus service to Grunna Voe instead of stopping at Laxo on a full journey between Vidlin and Lerwick has been considered in the journey time saving calculations covered in the Economy chapter of this report.

Options 4, 5 and 9, which see re-location of the Whalsay ferry terminal to North Voe, are not expected to negatively impact on the provision of public transport service relative to the Do-Minimum. With no existing timetabled bus service on Whalsay, re-location of the island ferry terminal to North Voe would have no impact on public transport provision on Whalsay.

14.3.2 Local Accessibility

The local accessibility criterion considers walking and cycling access to local activity centres and to public transport.

In terms of local accessibility, Options 2, 3 and 8, which retain the ferry services at Symbister, present no changes in opportunities for walking and cycling compared to the Do-Minimum option. The re-location of the Whalsay ferry terminal to North Voe, as proposed in Options 4, 5 and 9, has the potential to shift walking opportunities by up to 500m, benefiting those with origins/destinations closer to North Voe and potentially reducing walking opportunities for those with origins/destinations in the South Symbister area. The number of people using walking as a means of accessing the ferry terminal is currently estimated at less than 5% of all ferry users[33] (or under 7 person-trips per day). Ferry users using cycling as means of accessing the terminal

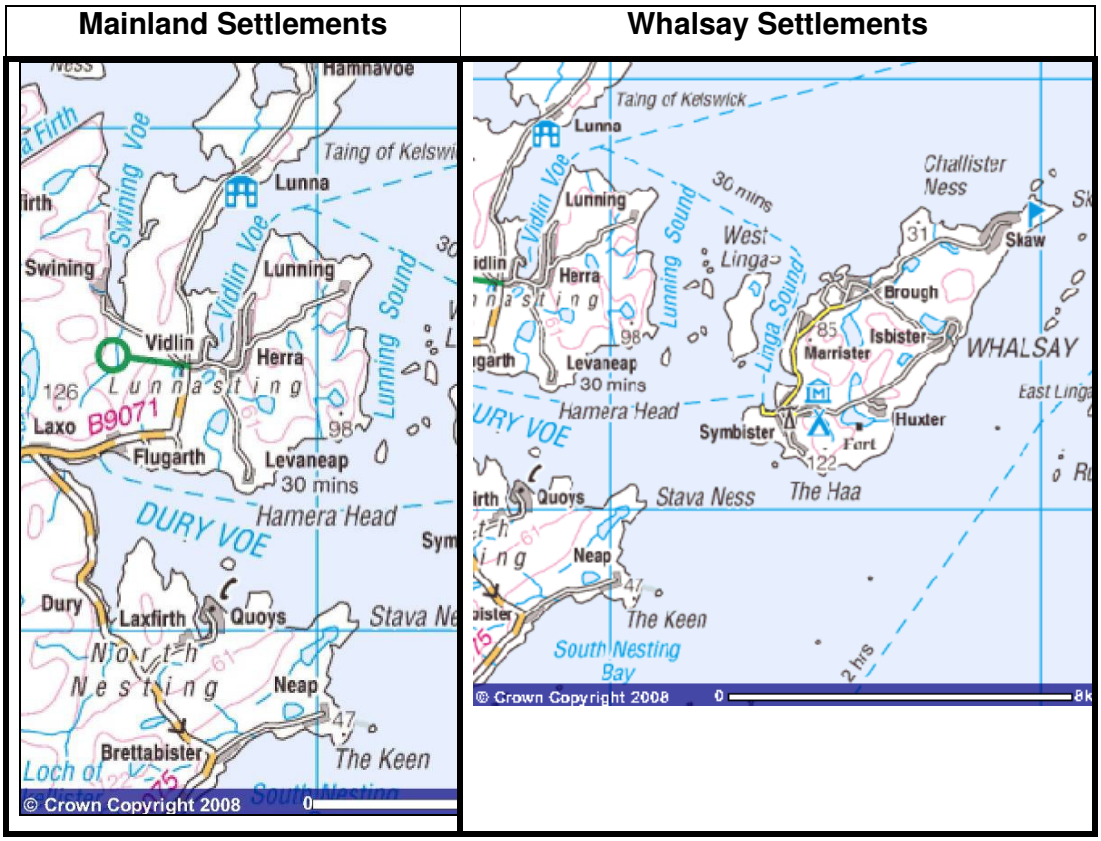
[31] Shetland Island Council Travel Directory online: http://www.shetland.gov.uk/transport/documents/2007transportdirectory.pdf
[32] Scottish Census Results On-Line, 2001.
[33] Whalsay Ferry User Survey

is relatively small at approximately 1% (one or two individuals per day). As of 2001, Symbister Harbour had a population of 225[34], while the overall population of Whalsay is approximately 1110[35]. The overall impact of relocating the ferry terminal from Symbister Harbour to North Voe is considered to be low or negligible.

Similarly, Options 8 and 9, which propose re-locating the Mainland terminal to Grunna Voe, are not expected to result in any changes in community comparative accessibility. The ferry terminal on the Mainland, whether located at Laxo or at Grunna Voe, is expected to neither improve nor reduce walking, cycling or public transport opportunities. At present, there are currently no walking opportunities to/from the Laxo terminal and very few opportunities for cycling, largely due to the scarcity of origins and destinations within walking and cycling distance of the existing terminal at Laxo. Re-locating the ferry terminal to Grunna Voe, as proposed in Options 8 and 9, would neither improve nor reduce opportunities for walking and cycling.

Figure 14.1 shows the settlements that may be affected by the re-location of either the Mainland or Whalsay ferry terminals.

Figure 14.1: Settlements in the Whalsay and the Mainland areas



All options would improve access relative to the Do-Minimum between Whalsay and the Mainland, primarily through increased capacity. Options 2, 4, 8 and 9 propose introducing one 31-vehicle ferry on the Whalsay-Mainland route, increasing capacity to 31 vehicles on approximately 60% of the sailings. Options 3 and 5, which propose introducing two 31-vehicle

[34] Scottish Census Results On-Line, 2001, Usual Resident Population in the postcode ZE2 9AA.
[35] Scottish Census Results On-Line 2001. Includes Whalsay and Skerries.

ferry vessels to the service, would offer increased capacity on all sailings. The annual vehicle capacity of each of these options is summarised in Table 14.3.

Table 14.3: Annual Vehicle Capacity

Description	Options	Annual Capacity (PCU*s)
Do-Minimum	Option 1	198,536
One 31-vehicle ferry and MV *'Linga'*	Options 2, 4, 8 and 9	320,788
Two 31-vehicle ferries	Options 3 and 5	393,328

*Passenger Car Equivalents.

Improved capacity, as proposed in all options other than the Do-Minimum (Option 1) would improve access to basic services such as medical care (including dental and hospital services), secondary schools, social events and other services. In addition to capacity, the 31-vehicle ferry may potentially offer better reliability in poor weather, thus further improving access to services.

14.4 Comparative Accessibility

Comparative accessibility is considered to change where there is re-location of transport infrastructure or services, or where the groups of users changes.

14.4.1 Distribution of Impacts by People Group

The changes in service proposed in Options 2, 3, 4, 5, 8 and 9 relate to capacity of service, design and location of facilities. These options are not expected to produce any differential changes in comparative accessibility relative to the Do-Minimum option.

With regard to potential accessibility impacts on groups such as women, black and ethnic minorities, the elderly, children, those with physical or sensory disabilities, faith groups, and/or sexual orientation, none of the options generated are expected to precipitate any differential changes. Differences between the options relate to costs, designs, and capacity of the crossing infrastructure and these would not differentially impact any of these groups.

With regard to disability access, all Options which propose introduction of the 31-vehicle ferry vessel are expected to provide improved access to passenger accommodation relative to the Do-Minimum. Passenger accommodation on MV *'Hendra'* is not currently accessible by wheelchair and does not comply with regulations set out in the Disability Discrimination Act (1995). All of the Options over and above the Do-Minimum offer improved accessibility through the introduction of accessible 31-vehicle ferry vessels.

It is assumed that all options would impose similar user crossing costs as the existing fare structure. This assumption includes ferry fares (for all options). At present, there is no indication that the fare structure will change, however, there remains a degree of uncertainty regarding fare structures in the medium- to long-term. If fares were to be increased, there may be distributional impacts in accessibility, most notably on lower-income households on Whalsay.

14.4.2 Distribution of Impacts by Location

The re-location of the Whalsay ferry terminal to North Voe, as proposed in Options 4, 5 and 9, has the potential to shift walking opportunities by up to 500m, benefiting those with origins/destinations closer to North Voe and potentially reducing walking opportunities for those with origins/destinations in the South Symbister area. The number of people using walking as a means of accessing the ferry terminal is currently estimated at less than 5% of all ferry users[36] (or under 7 person-trips per day).

Similarly, the accessibility impacts associated with re-locating the Mainland terminal to Grunna Voe is expected to be negligible as there are very few residents or other origins/destinations in the area surrounding the existing ferry terminal location at Laxo.

[36] Whalsay Ferry User Survey

Re-location of the Mainland terminal to Grunna Voe, as proposed in Options 8 and 9, is not expected to result in any changes in comparative accessibility. The majority of ferry users[37] have either their trip origin or destination beyond the area immediately surrounding either the Laxo or Grunna Voe locations and would therefore be unaffected by the re-location of the Mainland terminal. It would however add a delay for people boarding the bus between Vidlin and Lerwick adding an additional 10 minutes to the journey time as the bus would travel via Grunna Voe.

14.5 Summary

In options which propose an increase in capacity, as all options with the exception of the Do-Minimum propose, accessibility to services is expected to improve. Increased capacity would mean that ferry users, particularly vehicle drivers, would have greater chances of travelling on their first choice sailing rather than waiting for a later sailing or switching to an alternative mode of travel. In addition, the 31-vehicle ferry vessel is expected to offer better reliability in inclement weather and poor crossing conditions, thus improving overall accessibility of the island.

None of the options present either significant benefits or obstacles in terms of comparative accessibility relative to the Do-Minimum case. Walking and cycling opportunities are not affected by any of the proposed changes in locations of ferry terminals at either Laxo, Grunna Voe, Symbister or North Voe. Similarly, none of these proposed ferry terminal re-location proposals are expected to have any impact, either negative or positive, on the accessibility with regard to different groups of people, including women, black and ethnic minorities, faith groups and/or sexual orientation.

[37] The ferry user survey indicated that at least half of ferry users either originated or were bound for Lerwick with others either originating or heading to Brae, Scalloway, Sumburgh and Sullom Voe.

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Integration

15 Integration

15.1 Introduction

'Integration' in a transport sense encompasses the model of a seamless travel experience in a way that fits with local existing and planned land-use developments, structure plans and policies. A proposal that offers good integration will also fit with the interests of stakeholders.

In June 2004, the Transport White Paper "Scotland's Transport Future" set out the Government's transport policies. The White Paper seeks, among a number of overall aims, to "*improve integration by making journey planning and ticketing easier and working to ensure smooth connection between different forms of transport.*"

The National Transport Strategy (NTS) (Scottish Executive, December 2006) further develops the then-Scottish Executive's aims and objectives for transport[38], as set out within the White Paper. The NTS sets out three strategic outcomes, including:

"Improve journey times and connections, to tackle congestion and the lack of integration and connections in transport which impact on our high level objectives for economic growth, social inclusion, integration and safety."

The integration objective comprises three sub-objectives: transport integration, transport and land-use integration and policy integration. The following sections set out how the proposals fit with these three sub-objectives.

15.2 Transport Integration

An integrated transport system must operate as a true network across all modes in order that passengers can move easily from one service to another in a comfortable environment. Integrated transport can, thus, reduce the need to travel, tackle congestion and pollution and support a strong economy, a sustainable environment and a healthy and inclusive society. Consideration of integrated transport typically considers the integration of different elements of the public transport network (ticketing, interchanges, timetables, inter-modal opportunities), but extends to includes opportunities such as park and ride, and even park and share facilities.

In the context of the Whalsay-Mainland transport link, there are no expectations of modal shift associated with any particular option, and in this respect, differences in transport integration between the options are therefore relatively few.

The current system for booking vehicle space on the ferry was identified as a problem and opportunity that may be addressed. The booking system was identified as an issue primarily because individual sailings were frequently fully-booked, particularly on the 'commuter sailings', whilst it was often the case that booked spaces were not utilised. This meant that a proportion of vehicles waiting to board a particular sailing often did so on a 'stand-by' basis, thus introducing a degree of uncertainty to the ferry user with respect to their journey. Alterations to the system for booking space on the ferry could improve transport integration. Improvements to the booking system are not tied to any particular option. In other words, transport integration could be improved in all Options, including the Do-Minimum, through changes to the ferry booking system. It is noted that the Ferry User Survey conducted in October 2007 indicated mixed responses regarding the need to book space – some indicated that no booking was required whilst others indicated a degree of stress in waiting for the ferry on a stand-by basis.

Transport integration can also be affected by the introduction or removal of interchanges. The ferry infrastructure would appear to present an 'extra' interchange to journeys to and from Whalsay. From a user standpoint, however, the requirement to switch from vehicle (or any other mode) to ferry is not a significant interruption to the journey.

[38] The objectives set out in the NTS by the Scottish Executive in December 2006 have been retained for the time being by the Scottish Government as the overarching policy framework for Scotland.

From a user perspective, the quality of transport infrastructure (including ferry terminals, pedestrian and cycling facilities, and so on) can impact on a journey. At worst, poor amenities and facilities can 'interrupt' a journey by deterring the user from particular aspects or elements of the journey. Quality can refer to waiting areas, amenities on site (eg toilets), but also the layout of the interchange (eg. Distances between boarding points, changes of level, widths of corridors, barrier-free design and weather protection).

Information is another aspect that can affect transport integration, specifically the provision of accessible information, the provision of whole-journey information and accuracy of information. Lastly, adequate signage can impact on transport integration.

At present, transport integration is considered to be diminished on the Whalsay-Mainland ferry service, particularly on the peak hour commuter sailings. With commuter sailings being either full or having the perception of being full, there are user impacts on the quality of the journey, through uncertainty, stress, and potential delay. Transport integration can be argued to improve in Options which propose the introduction of the 31-vehicle ferry vessels and introduce extra capacity. The 31-vehicle ferry vessels would provide more comfortable passenger accommodation than MV *'Hendra'* currently provides, with new seating area facilities, toilets, and a better view from the passenger deck.

The proposed options could present various benefits and disadvantages to the movement of freight. These are primarily related to timetable constraints of the ferry service and the costs associated with waiting for the ferry. These impacts are included in Chapter 13 which addresses economic impacts.

15.3 Land-Use Integration

Land-Use integration refers to the way in which a transport proposal fits with established land-use plans and land-use /transport planning guidance.

Potential issues with transport and land-use integration would be of possible concern on the Whalsay side, where some of the options propose re-locating the ferry terminal to North Voe. In these cases (Options 4,5 and 9), integration with surrounding developments is not expected to interfere with any existing developments, however, a terminal located at North Voe could, depending on the volume of traffic, introduce some degree of noise for residences located near-by. There is potential for some degree of congestion, again, depending on the volume of traffic that would be attracted to the terminal. At present, the traffic levels (maximum 16 vehicles per sailing) do not present these types of problems. Increased capacity on the ferries may lead to greater demand in the long-term, and pose congestion or noise issues further down the line. This is analysed in greater detail in the environmental appraisal presented in Chapter 11.

Presently, there are several fish farm cages located at the mouth of the North Voe harbour, all with temporary licensing. Development of a North Voe ferry terminal (Options 4,5 and 9) would require revision to these licenses and would involve re-location of the southern-most cage. Although a suitable amount of time would need to be given the owner of the fish farm has indicated that this does not present a problem and it is the least productive cage in the fish farm.

New ferry terminals at the existing location in Symbister Harbour, as proposed in Options 2 and 3, would make use of existing infrastructure. There would be no expected land-use and transport integration issues associated with these options. At present, marine congestion has been cited as a barrier to integration as the ferry is required to negotiate marine traffic in Symbister Harbour which can potentially lead to delay or accident. The safety aspects of all options are more fully detailed in Chapter 6 of this report.

With regards to future developments, both the existing ferry terminal location at Symbister and the proposed North Voe ferry terminal location are located within areas zoned where housing development is encouraged. No other immediate land use developments are proposed for these areas.

In addition, stakeholders have expressed varying opinions on whether marine activity on Whalsay should be concentrated in one voe (i.e. Symbister) or be separated (i.e. Symbister and North Voe). Separating marine activity would have the potential advantage of alleviating

harbour congestion, whilst retaining activity in one location is considered undesirable because '*it would be a shame to develop another Voe*[39]*.'*

Option 8 and 9, which propose relocating the Mainland ferry terminal to Grunna Voe, would not pose any land-use-transport integration issues. There is currently an unpaved access road and an existing pier at the site of the proposed terminal.

With regard to ferry options for the Mainland, neither the Laxo option or the Grunna Voe option is expected to precipitate any changes, positive or negative, in integration.

At the existing Symbister Ferry terminal, there is little land-use development in the immediate surrounding area aside from the ferry terminal itself. Destinations that are near the Symbister ferry terminal, such as the Leisure Centre, are located between the existing ferry terminal and North Voe. In other words, there are minor differences in land use integration between the existing Symbister location and the proposed North Voe location.

15.4 Policy Integration

15.4.1 National and Regional Policy Integration

The White Paper, Scotland's Transport Future, quotes economic growth, social inclusion, health and protection of the environment through a safe, integrated, effective and efficient transport system as key areas for consideration when planning transport, recognising that transport decisions have wide impacts upon communities.

Building on these key objectives, the NTS identifies three key strategic outcomes in order to achieve the vision and objectives set out within Scotland's Transport Future: Improve journey times and connections; reduce emissions and improve quality and accessibility and tackle affordability.

In addition the NTS recognises the importance or lifeline links, and states:

"*We are committed to sustaining the viability of remote and fragile communities through ensuring access to lifeline air and ferry services…We are committed to maintaining lifeline ferry services and to ensuring that wherever technically and financially possible, ferry services are developed to improve access to vulnerable island and peninsular communities."*

The Policy Integration criterion examines whether the proposed scheme contributes to and is consistent with, other Government policies and legislation beyond transport. The Whalsay-Mainland transport link can contribute to the following wider Government policies:

- Rural affairs – All Options detailed in this report satisfy the national objective of 'sustaining the viability of remote and fragile communities'. In Options which propose increasing capacity through introduction of the 31-vehicle ferry vessel, the viability of Whalsay is promoted.
- Social inclusion – the Whalsay-Mainland transport link fits in with policies to promote social inclusion, by maintaining or improving access to services for residents on Whalsay. All Options which improve accessibility through increased capacity confer benefits with regard to social inclusion. These benefits are detailed in Chapter 8.

15.4.2 Integration with Local Policies

All options broadly align with policies and proposed developments identified in the Whalsay Community Statement (Shetland Island Local Plan) and the Shetland Structure Plan.

The Shetland Structure Plan states:

"The availability of good access to facilities is fundamental. This means on the one hand, provision of affordable transport and, on the other, the location of facilities where they can be conveniently reached. The wise planning of transport and land use can therefore make a significant contribution to the reduction of social exclusion."

[39] Whalsay STAG Part 1 Report: Consultation Response Summary

Assuming that transport-land-use integration issues adjacent to the North Voe ferry terminal proposed in Options 4, 5 and 9 can be mitigated, the provision of good access would be maintained to its current levels as required by the Structure Plan. With regard to the Mainland ferry terminal options, Laxo and Grunna Voe, neither present any infringements with regard to the current Local and Structure Plan.

The Whalsay Community Statement Housing Zones were revised in the Spring 2007. Symbister Harbour and North Voe are both classified as 'Housing Zone 1'. This means that housing development in these areas is encouraged. Neither of the proposed sites for the Whalsay ferry terminal (Symbister Harbour and North Voe) are located within or close to areas designated as a Local Protection Area.

On the Mainland, the Lunnasting Community Statement (amended in Spring 2007) indicates areas of housing development in the Laxo and Grunna Voe areas. At present, Laxo and Skelberry are designated at Housing Zone 2. The existing ferry terminal at Laxo is within the boundaries of this zoned area. Housing Zone 2 refers to '*settled countryside, where communities wish to encourage development*[40]*.'* Re-development of the ferry terminal at Laxo aligns with and supports proposals set out in the Local Plan. The proposed site at Grunna Voe is located in an area designated as Housing Zone 4, which refers to '*sparsely populated or generally uninhabited areas where development is strictly controlled*[41]*'*. Although development is discouraged in the Grunna Voe area, the proposed ferry terminal does not necessarily contravene the Local Plan. Special consideration would need to be made in light of overall arguments supporting development of the Mainland terminal at Grunna Voe.

The ZetTrans Regional Transport Strategy (RTS) was finalised for submission to Scottish Ministers in 2007. With regard to the Whalsay-Mainland transport link, the RTS states support for outcomes from the Whalsay STAG Part 1 report (i.e. redevelopment of ferry terminals at Laxo and Symbister, and, if funding is available, redevelopment of Vidlin as a diversionary terminal). As the RTS supports outcomes from the STAG Part 1 report, it is considered that Options in the STAG Part 2 report do not contravene the RTS.

15.4.3 Integration with Environmental Legislation

None of the options infringe on any Special Protection Areas (SPAs). There is potential infringement on a Site of Special Scientific Interest (SSSIs) with regard to the Options which propose relocating the Mainland terminal to Grunna Voe (Options 8 and 9). Full details of the environmental appraisal are provided in Chapter 11 and Appendix G of this report.

15.5 Summary

Overall, transport integration is not considered to be significantly affected by any of the Options with regard to land-use integration and policy integration. Although some Options align or support Local Plans and local land-uses to a greater degree than other Options, the benefits or advantages conferred are considered few or negligible in the context of the scale of the project.

With regard to the quality of travel, Options 2, 3, 4, 5, 8 and 9, all of which propose introduction of the 31-vehicle ferry vessel, there are significant advantages over the Do-Minimum case. The advantages are two-fold. First, the extra capacity on the 31-vehicle ferry removes a degree of uncertainty from the travel experience, thereby reducing stress and improving the overall travel experience of the user. It is believed the 31-vehicle ferry would be capable of travel during worse weather and poorer crossing conditions, albeit the performance of the 31-vehicle ferry relative to MV *'Linga'* and MV *'Hendra'* in poor crossing conditions remains unknown. Second, the 31-vehicle ferry would provide more comfortable travel accommodation for ferry passengers, thus improving the overall quality of the travel experience.

[40] Zone 2 areas are generally areas where the population is static or falling. New houses or conversions and refurbishment are favourably considered in this zone. However, proposals to develop on the best agricultural land will be discouraged.

[41] This is open countryside; government policy is to restrict development here. The zone policy permits the building of new houses for agricultural or social support. As the justification is agricultural or social support, the policy requires the new house to form a group with the existing buildings on the holding. Exceptions may be made for new dwellinghouses on new or bareland crofts. Planning permission may also be granted for the restoration and extension of abandoned dwellings.

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Costs and Deliverability

16 Costs and Deliverability

16.1 Introduction

This chapter sets out the costs discounted to a common year (2002), so that they can be compared with the transport benefits presented in chapter 13. The costs that STAG requires to be assessed are:

- Public sector investment costs;
- Public sector operating and maintenance costs;
- Grant/subsidy payments;
- Changes in revenue; and
- Changes in indirect taxation.

16.2 Capital (Investment) Costs

The undiscounted costs are presented in 2008 prices; the discounted values are presented in 2002 prices and 2002 values. They are assessed over a 30 year period from the first year of operation. Optimism bias has been applied based on Government guidance (chapter 17 refers).

Table 16.1 presents the estimated capital costs for each element of the options. In accordance with the Green Book Guidance issued by the Treasury, uplift factors have been applied to each of these options to account for potential costs associated with the risks highlighted in the previous section.

Table 16.1 provides a summary of initial cost estimates, uplift factors and final cost estimates associated with each of the infrastructure options.

Table 16.1: Estimated Cost Summary of Options

	Initial Cost Estimate (£000s)	Uplift Factor	Final Cost Estimate (£000s)
Do Minimum	Year 1 £740,000 Year 10 £250,000 Year 20 £250,000	66%	Year 1: £1,228,000 Year 10: £415,000 Year 20: £415,000
Upgraded Symbister Harbour terminal with Inward extension	-£12,933,000	66%	£21,469
Upgraded Laxo terminal with extension	-£6,700,000	66%	£11,122
North Voe	-£10,300,000	66%	£17,098
Grunna Voe	-£9,470,000	66%	£15,720
Vidlin upgrade	-£3,800,000	66%	£6,380
Procurement of Ferry Vessels *	31-veh vessel £11,000 *'Linga'* £7,880 *'Hendra'* £6,560	13%	31-veh vessel £12,430 *'Linga'* £8,904 *'Hendra'* £7,413

* Optimism bias has been reduced for the procurement of ferry vessels as recent, accurate quotes have been received from shipyards and this element of the packages is considered to be relatively straightforward once the order is placed. It is, however, acknowledged that external factors which contribute to optimism bias may still have an impact on the final procurement costs. The external factors which contribute to the non standard civil engineering projects account for 20% of the overall 66% uplift and this is equivalent to a 13% uplift.

The estimated costs for each of the Option packages is summarised in Table 15.3 following adjustment to 2002 prices using RPI, discounting to 2002 values and factoring to market prices in line with WebTag.

Table 16.2: Cost Summary of Options (discounted to 2002 values and 2002 market prices)

Option	**Final Cost Estimate with optimism bias and adjusted for indirect taxation (£millions)**
Option 1 – Do-Minimum	£18.9
Option 2 – Symbister with extension, plus upgraded Laxo terminal, plus one new 31-vehicle ferry vessel	£57.0
Option 3 – Symbister with extension, plus upgraded Laxo terminal, plus two new 31-vehicle ferry vessels	£67.3
Option 4 – North Voe terminal, with Laxo terminal, plus one new 31-vehicle ferry	£52.0
Option 5 – North Voe terminal, with Laxo terminal, plus two new 31-vehicle ferries	£63.3
Option 8 – Grunna Voe, plus one new 31-vehicle ferry, plus Symbister terminal with extension	£54.3
Option 9 – Grunna Voe, plus one new 31-vehicle ferry, plus North Voe terminal	£50.4

16.2.1 *Operating and Maintenance Costs*

Options 2, 3, 4, 5, 8 and 9 propose the introduction of one or two new 31-vehicle ferries. These vessels may require cover or ship-keeping 24 hours a day, 7 days a week. This requirement would introduce additional revenue costs to these options. Concurrently, the requirement would provide benefit in terms of job creation (details are outlined in EALI).

The ongoing operating and maintenance costs associated with each of the Options are summarised in Table 16.3.

Table 16.3: Maintenance and Operating Costs (discounted over 30 years to 2002 market prices, 2002 values)

Option	Maintenance and Operating Costs (adjusted for indirect taxation) (£ millions)
Option 1 – Do-Minimum	14.0
Option 2 – Symbister with extension, plus upgraded Laxo terminal, plus one new 31-vehicle ferry vessel	18.9
Option 3 – Symbister with extension, plus upgraded Laxo terminal, plus two new 31-vehicle ferry vessels	19.4
Option 4 – North Voe terminal, with Laxo terminal, plus one new 31-vehicle ferry	18.9
Option 5 – North Voe terminal, with Laxo terminal, plus two new 31-vehicle ferries	19.4
Option 8 – Grunna Voe, plus one new 31-vehicle ferry, plus Symbister terminal with extension	18.6
Option 9 – Grunna Voe, plus one new 31-vehicle ferry, plus North Voe terminal	18.6

16.2.2 *Revenue Forecast*

Based on the forecasts highlighted in Chapter 13 and assuming current fare prices, fare revenues over the period to 2038 were forecast. Fare revenue forecasts for each of the options are listed in Table 16.4.

Table 16.4: Forecast Fare Revenues up to 2038 (discounted to 2002 prices, 2002 values)

Options	Total Forecast Revenue £ millions (adjusted for indirect taxation)
Do-Minimum (MV *'Linga'* + MV *'Hendra'*)	7.8
Options 2, 4, 8 and 9 (MV *'Linga'* + One 31-vehicle ferry	8.4
Options 3 and 5 (Two 31-vehicle ferries)	8.5

Calculations and assumptions used to determine the revenue forecasts are detailed in Appendix H.

16.3 Present value of Cost to Government

Table 16.5 - Cost to Public Sector (£millions, 2002 values and market prices)

	Option 1	Option 2	Option 3	Option 4	Option 5	Option 8	Option 9
Public sector investment costs	32.9	56.0	67.3	52.0	63.3	54.3	50.4
Public sector operating and maintenance costs	11.6	15.6	16.0	15.6	16.0	15.4	15.4
Grant/subsidy payments	0	0	0	0	0	0	0
Revenues	6.4	6.9	7.1	6.9	7.1	6.9	6.9
Taxation impacts	0	0.012	0.013	0.012	0.016	0.019	0.019

The public sector investment costs are the capital costs that are spent to construct the infrastructure necessary to enable the services.

The public sector operating and maintenance costs are the ongoing burden imposed on the public purse by the service options and increased infrastructure. This is assumed to cover the running of the ferries, and the upkeep and maintenance of the infrastructure.

Grant/subsidy payments are fund transfers to the private sector to cover the ongoing costs of the service options and infrastructure. This is not applicable to the Whalsay ferry service and is therefore zero. .

Indirect taxation revenues would change when a scheme shifts expenditure to or from fuel, which is heavily taxed, and to or from public transport fares, which are not taxed. This must be reflected in the assessment. The results show small but increasing levels of indirect taxation due to the increased number of trips and hence use of vehicles generated by some of the options.

16.3.1 *Monetised Summary*

This Section presents the benefits from the safety and TEE sections of the analysis and compares them with the Cost to Government shown above. This allows a judgement to be made as to the value for money of the service options. However, it should be emphasised that not all transport benefits are able to be expressed in money terms, and that there may be other benefits to society, not transport related, that could result from implementation of the options.

This is particularly true for a project such as this where the focus is on maintaining a transport link to a remote island. In doing so, there are benefits for sustaining vibrant rural locations and safeguarding their future and many benefits related to accessibility and social inclusion.

Table 16.6 - Monetised Summary of Costs and Benefits (£millions, 2002 values and prices)

	PVB	PVC	NPV	BCR*
Option 1 – Do-Minimum	£7,787,840	(£30,543,449)	(£22,755,609)	0.25
Option 2 – Symbister with extension, plus upgraded Laxo terminal, plus one new 31-vehicle ferry vessel and MV '*Linga*'	£9,235,932	(£64,437,157)	(£55,201,226)	0.14
Option 3 – Symbister with extension, plus upgraded Laxo terminal, plus two new 31-vehicle ferry vessels	£9,641,710	(£74,566,203)	(£64,924,493)	0.13
Option 4 – North Voe terminal, with Laxo terminal, plus one new 31-vehicle ferry and MV '*Linga*'	£9,235,932	(£60,821,128)	(£51,585,197)	0.15
Option 5 – North Voe terminal, with Laxo terminal, plus two new 31-vehicle ferries	£9,641,710	(£70,950,174)	(£61,308,464)	0.14
Option 8 – Grunna Voe, plus one new 31-vehicle ferry and MV '*Linga*', plus Symbister terminal with extension	£8,127,956	(£63,627,705)	(£55,499,749)	0.13
Option 9 – Grunna Voe, plus one new 31-vehicle ferry and MV '*Linga*', plus North Voe terminal	£8,127,956	(£60,011,676)	(£51,883,720)	0.14

*ratio, not monetary value

The Net Present Value (NPV) is calculated as the Present Value of Benefits (PVB) minus the Present Value of Costs (PVC). It therefore calculates the net benefit to society. In an ideal world, any scheme with a positive NPV would be implemented, as society gains. However, as funds are scarce, another indicator is required. The Benefit to Cost Ratio (BCR) is the Present Value of Benefits divided by the Present Value of Costs multiplied by negative one. This therefore presents the amount of benefit society gets from each pound spent on the project.

The options all produce negative NPV and BCRs of less than 1. This is reflective of the rural nature of this project and as stated above many benefits which arise out of such a project can not be monetised.

16.4 Deliverability and Public Acceptability

Deliverability has been a key consideration during the development of the Whalsay options. Clearly, any option which cannot be delivered could not be taken forward.

The implementation of the preferred package should involve minimum disruption to the transport network and the travelling public. It should also be compatible with potential long-term development strategies within the study area. Construction and operational risks associated with the implementation of the preferred option should be minimised.

It is considered that all of the proposed options could be delivered successfully. Although it is noted that work involving the existing terminals, particularly at Symbister will involve careful planning to minimise the disruption to the ferry service. This is discussed in more detail in chapter 17.

Public acceptability is also of key concern and consultation has been undertaken throughout the study with the community, mainly through liaison with the Ferry Terminal and Service Working Group, put forward by the community to represent all aspects of the fishing industry, the ferries, and the local community.

Generally Laxo has been more publicly acceptable than Grunna Voe and the need for Vidlin is considered by the community to be indisputable. The public view between Symbister and North Voe is split with benefits and disbenefits to both options. The ferries that are currently on the route are considered to be at capacity during peak periods and there has therefore been general support for the provision of more capacity on the route.

16.5 Summary

This chapter has presented the costs and figures for the maintenance and operation of the various options and provided the economic summary for NPV and BCR of each of the options. The following chapter considers the various project risks and technical considerations.

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Technical Considerations and Risk

17 Technical Considerations and Risk

17.1 Introduction

This section details the technical considerations, risks and costs associated with each of the options.

The risks to successful approval of the scheme come from many different sources, of which the technical risks and associated cost risks are only one. Similarly, following approval of the scheme there are many possible sources of risk prior to commencement of operations.

Risk management strategies should be adopted throughout the appraisal and implementation stages of proposals in order to ensure that steps have been taken to prevent and mitigate risks and uncertainties. Once reliable estimates of relevant costs are built up, risks are explicitly assessed and quantified, and work to minimise project-specific risks is undertaken, any optimism bias can be reduced.

Once risk factors have been explicitly quantified and valued, adjustment should be made to the costs and benefits in order to calculate risk-adjusted "expected values". An expected value provides a single value for the expected impact of all risks. However, in general, even with a well-developed project, there will remain some risks which cannot be foreseen. In such cases it will not be possible to include these risks in the expected value, so instead a contingency figure should be added in order to take account of possible unanticipated risks.

This Chapter outlines the principles of Risk and Uncertainty from the work undertaken to date.

Ultimately, the purpose of the work being undertaken is to maintain or provide for the transport link between Whalsay and the Mainland. Additionally, the potential for a project of this magnitude to impact on the delivery of projects elsewhere on Shetland must be considered in terms of the potential risks and associated costs.

17.2 Optimism Bias

17.2.1 Process

Experience has demonstrated a tendency for insufficient contingency costs or programme time to be made; a phenomenon known as Optimism Bias. HM Treasury's Green Book has identified Optimism Bias as the systematic tendency for appraisers to be over-optimistic about key project parameters. Evidence from other major projects in the UK has confirmed this to be a major issue.

Optimism Bias provides a methodology to determine what level of additional cost and programme delay should be applied to a project given its particular stage of development. A project at the stage of developing a business case is inherently less certain, in terms of its cost envelope, than one which is close to contract signature. The Optimism Bias adjustment allows a factor to be applied to the capital costs of a project to reflect this and the costs involved in mitigating the impact of this. Standard factors are given dependent upon the nature of the project, based on analysis of previous schemes. This Optimism Bias adjustment sits as a percentage factor independent, but inclusive, of any specific contingencies identified for the particular scheme. It is therefore a predictor of where the costs might finally end up. No Optimism Bias adjustments exist at present to cover operating costs, lifecycle costs or revenue.

17.2.2 Benchmarking / Factors Adopted

In accordance with guidelines, cost estimates and anticipated construction programme durations developed for the scheme are subject to adjustment using Optimism Bias uplift factors. These are set out in the Mott MacDonald Report for HM Treasury: "Review of Large Public Procurement in the UK" dated July 2002.

The Whalsay-Mainland transport link, provided it is maintained as a ferry link as all existing options propose, is likely to be regarded as a 'Non-standard Civil Engineering' project for the terminal works. The starting values for optimism bias uplift calculations adopted are respectively:

- 66% for capital costs; and
- 25% for works duration.

These values are based upon an analysis by Mott MacDonald of a number of previous contracts, which examined the reasons for delay and increased costs and allocated a proportion of total increases to categories and sub-categories of risk. This allocation is utilised when estimating the reduction in Optimism Bias uplift arising from implementation of the mitigation strategies, as described below.

Table 17.1: Application of Optimism Bias

Category	Sub Category	Impact on Works Duration (as %age of 25%)	Impact on Capital Cost (as %age of 66%)
Procurement	Complexity of contract	4	
	Late contractor involvement in design	<1	
	Poor contractor capabilities	2	
	Government guidelines		
	Dispute and claims occurred	16	
	Information management		
	Other procurement areas	1	2
Project Specific	Design complexity	5	8
	Degree of innovation	13	9
	Environmental Impact		5
	Other project specific areas	3	
Client Specific	Inadequacy of Business Case	3	35
	Large number of stakeholders		
	Funding availability		5
	Project management team		2
	Poor project intelligence	3	9
	Other client specific areas		
Environment	Public relations		
	Site characteristics		5
	Permits, consents and approvals		
	Other environmental areas		
External Influences	Political	19	
	Economic	24	3
	Legislation and Regulation		8
	Technology	6	8
	Other external influence areas	<1	1
		100%	100%

17.3 Risk Management Process

STAG states that: "In appraisals there is always likely to be some difference between what is expected, and what eventually happens, because of biases unwittingly inherent in the appraisal, and risks and uncertainties that materialise. As a result, it is important to identify and mitigate risks, and make allowances for 'optimism bias''. It goes on to recommend the use of a plan for management of risk.

The objectives of the risk management process are to:

- Identify risks from all sources;
- Assess the potential likelihood, impact and hence overall significance of those risks, thereby prioritising those most in need of management and mitigation;
- Identify appropriate mitigation strategy;
- Allocate responsibility for management of the mitigation process; and
- Periodically review progress towards mitigation and assess the resultant reduction in the Optimism Bias uplift factor.

Risk Identification

The process has involved inputs from all appropriate stakeholders, including Shetland Island Council Capital Projects team, ferry operators and managers, harbour master, and fishing skippers. Costs were based on past experience of recent contracts and a breakdown of the quantities required as compiled by SIC Capital Projects; contingencies have been allowed for within the cost estimates.

The primary risks associated with the appraisal of options in the Whalsay-Mainland context relate to technical considerations and unknowns. These are described in greater detail in the following sections.

17.4 Technical Considerations

As explained in the above section, there is a certain amount of risk inherent in any large-scale project. There are particular unknowns that become apparent only during or after project delivery.

This section details the technical risks that may carry considerable cost implications for each of the infrastructure options. There are significant risk and cost differences between the Do-Minimum Option and all other options.

17.4.1 Do Minimum

The Do-Minimum case proposes retaining the existing ferry infrastructure and ferry vessels and upgrading or replacing these items on a like-for-like basis as required. The technical risks and associated cost implications are considered low. The Do Minimum case sees sufficient upgrade works to safeguard the terminals for the future.

17.4.2 New Laxo Terminal and Breakwater

The proposed new Laxo terminal includes a 220 metre long breakwater extension into Dury Voe which is 10 m wide across the top and 60m wide across the bottom. The maximum water depth at the outermost point of the breakwater base is estimated to be 11 metres. An area of 5,100m2 requires to be dredged with a total dredged volume of 9,200m3. Risks and cost implications rise exponentially with increase in water depths with regard to delivery of breakwater extensions. The breakwater proposed for the new Laxo terminal is therefore considered to be medium risk in terms of cost and delivery times.

17.4.3 Upgraded Symbister Harbour with inward extension

There is greater certainty with regard to water depth and associated risk and cost implications associated with the inward extension proposed to accompany the option of an upgraded terminal at Symbister Harbour. The risk and cost implications are considerably lower than the previously considered outward extension.

The inward extension would require dredging a 17,000m^2 area of Symbister Harbour to 4.5 metres for the ferry operations and dredging an area of 8,500m^2 to a depth of 2.5m for the small craft marina.

However there are a few issues with developing the Symbister option which, whilst not insurmountable would require careful planning.

- What happens to the small boats when the existing Marina is removed to allow the dredging and piling to commence? There is no obvious alternative site within Symbister.
- There is limited nearby storage and working space for the Contractor.
- There may be a conflict between the existing marshalling area and construction work.
- The ferry service must be maintained, which will require the work to be phased. It will also impact on the dredging work.

17.4.4 *North Voe Terminal*

The proposal to develop a ferry terminal at North Voe on Whalsay involves a number of technical considerations and associated risk factors. The proposal involves the construction of two breakwaters; the final position of the breakwaters would be determined following mathematical and possibly tank modelling of the voe. The designs shown have the north breakwater with dimensions of 140m long, 10 m wide across the top and 43 m wide across the bottom going to a depth of 6m. The south breakwater shown has dimensions of 150m long, 10 m wide across the top and 55m across the bottom to a depth of 8m. Total dredged area is 17,100m^2 and the dredged volume is 14,900m^3. There is a high degree of confidence that the water depth measurements and costs associated with the first breakwater are accurate. There is less certainty with regard to water depths for the second breakwater on the south side of North Voe, and this may have moderate cost implications for the delivery of the North Voe option.

The feasibility of this option has been determined through mathematical modelling undertaken during the STAG Part One appraisal. Further modelling will be required if this option is to be taken forward, and may have associated cost implications.

17.4.5 *Grunna Voe*

The option of developing a new ferry terminal at Grunna Voe does not involve the construction of a breakwater or any dredging works. The primary risks are related to the construction of the terminal itself. Although water depth increases rapidly from the shoreline, the new terminal would require development of a short pier.

The risks associated with this option are considered to be low to moderate.

17.4.6 *Vidlin Terminal Upgrade*

The proposed new terminal at Vidlin comprises a relatively small area of land reclamation and a sheet piled jetty approximately 72m long and 10m wide. Water depths at the outermost end of the jetty are approximately 7m below C.D. There is no requirement for a breakwater due to the sheltered nature of Vidlin Voe, and dredging is not required due to the favourable topography of the seabed. It is therefore considered that there are no exceptional risk implications for the Vidlin terminal.

17.4.7 *Procurement of Ferry Vessels*

The appraisal of options has assumed that it takes two years to construct any of the ferry vessels. However, it is acknowledged that there is a backlog of work currently being dealt with in shipyards which will add to this time as new orders will be placed on a waiting list. There are also lengthy lead times for supply major engines and propulsion units: currently some 3 years. Typically a ferry can be delivered within 3 years of an order being placed but in some cases this can extend to 5 years. The appraisal of options has allowed for a four year lead in period. This would see the ferry available to coincide with the terminal upgrades being complete.

If the ferry vessels could not be delivered within four years, the cost implications associated with this relate to the requirement to extend the service lifespan of the existing ferry vessels. However, this is likely to be simple annual maintenance and repair of MV *'Linga'* and MV *'Hendra'*.

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Monitoring and Evaluation

18 Monitoring and Evaluation

18.1 Introduction

The Scottish Government requires monitoring and evaluation to be undertaken and documented for any proposal for which it provides funding or approval.

STAG guidance requires that a new project or strategy be subject to planned evaluation and monitoring, in addition to regular revalidation throughout its development.

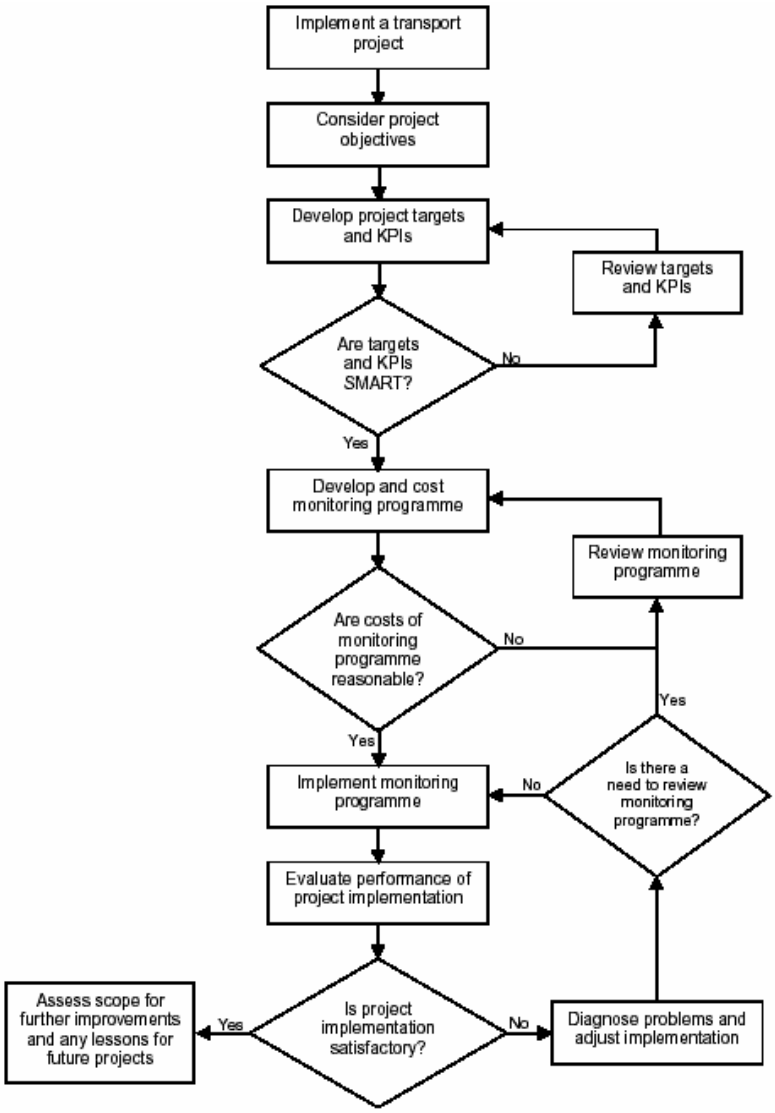
STAG defines Monitoring as *"an on-going process of watching over the performance of a project identifying problems as these arise and taking appropriate action",* whilst Evaluation is used for *"specific, post-implementation events, designed to assess the project performance against established objectives and to provide in-depth diagnosis of successes as well as deficiencies".* Therefore, by gathering and interpreting information, monitoring and evaluation will demonstrate how the project or strategy performs against its objectives, identify any deficiencies and allow adjustments to be made.

Soon after implementation, the performance of the scheme should be assessed against the specified objectives. Recognising that certain projects require time before the full benefits can be realised, a further evaluation is required some time after implementation.

In addition, regular monitoring of the scheme is essential against specified Key Performance Indicators (KPIs) to assess the ongoing effectiveness of the overall strategy and individual schemes.

This chapter sets out the methods and indicators that may be put in place to meet the requirements of the STAG guidance with respect to evaluation and monitoring.

Figure 18.1: The Monitoring Process



18.2 Base Case

In order to effectively monitor and evaluate a project or a programme of interventions, it is necessary to establish what would have happened in the absence of interventions. The base case scenario represents the absence of intervention. Monitoring projects against the base case scenario provides a means of gauging how well a project or programme of interventions meets the objectives set out when the project began.

Figure 18.1 outlines the process for the monitoring and evaluation of a project. It is important to note that just as objectives need to be achievable and relevant, so does the monitoring scheme need to be. Most monitoring and evaluation schemes require a coordinated effort of several organisations. Data collected and used for monitoring needs to be affordable, achievable and relevant. Much of the data should already be available and much of it will have been collated as part of this process.

The collection of any outstanding data for the base case will likely be a joint effort between Shetland Islands Council, ZetTrans, Whalsay Community Council, and Shetland Fishermen. It will be important for relevant organisations to discuss what information is available as part of their regular data gathering functions to avoid incurring additional cost and to limit the collection of new information to that which is strictly necessary to establish performance against scheme objectives.

Baseline data may include, but will not necessarily be limited to:

- Marine safety records;
- Road safety records;
- Passenger surveys;
- Incidence of marine accidents and conflicts at Symbister Harbour;
- Incidence of delayed ferry trips;
- Journey time crossing;
- Passenger and vehicle carryings on all sailings;
- Passenger and vehicle deck utilisation rates for all sailings;
- Incidence of vehicles left behind;
- Service frequency levels and daily operation time-span;
- Number of jobs maintained on Whalsay;

18.3 Project Development, Procurement and Construction

18.3.1 *Project Validation*

It is possible that circumstances may change within the time required for scheme development, approval and construction, which could affect the assumptions made regarding the proposals. During this time it will be necessary to keep under review the planning objectives, taking into account any changes in the underlying transport situation.

Cost and Revenue and Programme Monitoring

It is recommended that a management team comprising various advisors be appointed to manage the process of monitoring cost and revenue and programme issues throughout the development and construction of the preferred package. The team will thereby evaluate any potential for changes in project costs and associated risks.

18.4 Operations

18.4.1 *Process Evaluation*

Evaluations are specific post-implementation events designed to identify whether:

- A project has performed as intended (or under or beyond expectations);
- Established objectives have been achieved (fully or partially, and the reasons for any failures); and
- The project continues to represent value for money (also considering actual cost budget).

The Process Evaluation is conducted straight after the implementation. It will draw lessons for on-going implementation and for the design, management and implementation of future projects.

For the reasons given above with respect to Base Case data, it is not possible at this stage to be specific about the nature of the process evaluation.

Table 16.1, below, summarises a possible example which might be employed as the basis for the process evaluation:

Table 18.1 Evaluation Performance Indicators

Objective	Performance indicator/measure	Performance target	Source of indicator	Monitoring method and frequency
Costs	Proportion of actual costs over budget	■ X% of budget exceedance	Project costs	Budget and cost comparison – after implementation
	Proportion of budget allocated to SLC which was actually spent within timescale	■ X% budget spent by completion	Project costs by time	Project costs by time – after implementation
Views	The extent to which (stakeholder, public) consultation influenced outcomes	Significant number of views taken into account	Consultation process	Qualitative examination of consultation, by group
	Stakeholder's views on how well the project was designed and implemented	Overall positive views	Stakeholder interviews	Qualitative survey results by group – after implementation
Transport	The extent to which PARAMICS model results reflect reality	■ Traffic diversion ■ Congestion ■ Delays	PARAMICS model and traffic surveys	Comparison between modelled and actual – after implementation and again one year later
Local economy	Actual impact on economic activity	■ Employment ■ Commerce	Before and after surveys	Comparison between before and one year after implementation, by location and activity

Before the monitoring programme is agreed upon, consideration must be given to the actual availability of the data, practicalities from collecting new data, its format, whether it will properly reflect the indicators proposed and cost of obtaining it. Indicators and targets should be subject to regular reviews to ensure that they continue to properly reflect the performance of the project against its objectives, throughout the monitoring period.

Conclusions and Recommendations

19 Conclusions and Recommendations

19.1 Introduction

This report has set out the results of the STAG Part 2 appraisal of the Whalsay Transport Link Study. Recommendations regarding each of the elements of the transport link are provided below, followed by a description of the proposed package. A long list of options was considered at the STAG Part 1 stage. Appraisal summaries for the options are provided in the Appraisal Summary Tables (ASTs) provided in Appendix E of this report. This was reduced to 7 options for appraisal in the STAG Part 2 stage which were then fully appraised and ASTs completed and provided in Appendix F.

The study has shown that the preferred option would contribute to the achievement of the agreed planning objectives. The conclusions in relation to the principal STAG appraisal criteria are summarised below.

The 'Do Nothing' option is considered to be unacceptable. Currently the route suffers capacity constraints at peak times which is reported to be hampering the commuter base of the island. Almost one quarter (22% or 160 residents) of the working population on Whalsay commute to the Mainland and depend on a regular and reliable ferry service. Current issues with capacity lead to uncertainty about being able to travel which can cause personal stress to people and potentially make continued commuting to the Mainland untenable. Added to this is the uncertainty regarding the state of the infrastructure and the vessels serving the route. The infrastructure is currently operating at its limit in terms of berthing pressures with ever increasing maintenance costs required to keep the service operational. The route is served by two vessels, MV *'Linga'* and MV *'Hendra'*. MV *'Hendra'* was recently refurbished to extend her serviceable life but it is not anticipated that this could be extended further and she will need to come out of regular service use in approximately 2014; waiting time on new ferries is three years and can be potentially up to five years.

These factors all combine to provide a bleak future picture for Whalsay under the 'Do Nothing' scenario with ongoing capacity constraints hampering access to economic activity for residents of the island and increasing likelihood of service disruptions due to the aging infrastructure and vessels. All of this could serve to make living on Whalsay and commuting to the Mainland untenable which could in turn generate population decline on the island as people move off in search of employment opportunities.

The 'Do Minimum' does not perform much better as it does nothing to address the capacity constraints currently affecting the route. It merely serves to improve the infrastructure and thereby provide some operational reliability for the future. The capacity constraints however would still impact on the ability of people to live on Whalsay and commute to the Mainland and could potential result in population decline as people move off the island in search of employment opportunities.

The options considered have three elements; the Whalsay terminal, the Mainland terminal and the ferries providing the service on the route. The following sections take each of these elements in turn and discuss the appraisal relevant to each. After this, the appraisal of the combined elements is discussed.

19.2 Ferries

Two ferry vessels, MV *'Linga'* and MV *'Hendra'*, currently operate on the Whalsay – Mainland route, capable of providing a total of 36 sailings per day under reasonable weather conditions. The primary issues with regard to the ferries relate to capacity constraints, particularly on commuter sailings, life expiry of MV *'Hendra'* in the medium-term, affordability constraints regarding the procurement of any new vessels, and the need or desire to maintain existing levels of service to and from Whalsay in the short-, medium- and long-term.

The three options pertaining to the ferry vessels are:

(a) Do-Minimum – retain MV *'Linga'* and MV *'Hendra' and replace on a like for like basis (with* MV *'Hendra' due for replacement by 2014)*
(b) One larger-sized ferry – introduction of one 31-vehicle ferry vessel and retention of MV *'Linga'*
(c) Two larger-sized ferry vessels – introduction of two 31-vehicle ferry vessels.

Whilst the Do-Minimum option would impose the least cost, the option fails to address the issue of capacity. Service levels and accessibility to and from Whalsay are reduced under the Do-Minimum scenario and capacity is constrained consequently leading to diminished socio-economic prospects for the Whalsay community. It is believed that the capacity provision on the route is currently constraining the demand at peak times.

The remaining ferry options propose the introduction of one or two larger-sized ferry vessels. The 31-vehicle capacity vessel is capable of being interchanged with vessels on the Toft-Ulsta route. The introduction of one or two 31-vehicle ferries would address issues that the Do-Minimum option does not: capacity constraints on commuter sailings. With a capital cost of £11 million per vessel, the proposal of procuring one or two 31-vehicle ferry vessels necessitates consideration of affordability.

Passenger and vehicle growth forecasts indicate that the introduction of one 31-vehicle ferry (along with retention and maintenance of MV *'Linga'*) would address the current capacity problems and would continue to cater for anticipated growth until the year 2017 when the commuter sailings may start to suffer from some over demand. Introducing two 31-vehicle ferry vessels on the route would push back capacity constraints until the year 2032. Based on the demand forecasting and the need for affordability, the introduction of a second larger-sized ferry vessel is one that can be put off for about 10 years. This study recommends the retention of MV *'Linga'* and the introduction of one larger-sized ferry vessel.

Considering the ferries alone, it is therefore recommended that the option to retain MV *'Linga' and introduce a larger-sized ferry vessel onto the route provides the best way to address the problems identified through the STAG process.*

19.3 Mainland Terminal

Under good weather conditions, the Whalsay-bound ferry vessels operate out of the existing terminal at Laxo. The primary issue relating to the Mainland ferry terminal relates to the fact that in its current state, it cannot accommodate larger-sized ferry vessels. Secondary issues relate to affordability and to opportunities to potentially improve berthing conditions under adverse weather conditions.

The options for a Mainland terminal are:

(a) Do-Minimum – retain and maintain existing Laxo terminal as is;
(b) Upgrade Laxo terminal to accommodate larger-sized ferries; and
(c) New terminal at Grunna Voe.

In addition to this, there is also the issue of a diversionary port, currently provided at Vidlin. This issue is considered in section 19.5.

The Do-Minimum option would see the terminal at Laxo upgraded to safeguard its use for future years but it could not accommodate the larger sized ferries. The option to upgrade the terminal would allow larger sized ferries to berth and open up a larger degree of flexibility for the Shetland inter-island fleet. The works could be undertaken whilst current operations continued at Laxo.

The option of developing a new terminal at Grunna Voe arose when it was thought that the site would provide better berthing conditions in adverse weather conditions. It was considered that the option to provide a new terminal at Grunna Voe and undertake the necessary infrastructure improvements would be worth further appraisal on the basis that the diversionary terminal may not be required (and hence would not be upgraded to accommodate the larger ferries) between

the larger (and possibly more seaworthy) ferry being on the route and the better berthing conditions. The options considered with Grunna Voe retained MV *'Linga'* on the route to serve alongside the larger ferry in order that one vessel would be available should a diversion to Vidlin be necessary.

Upon closer examination within the STAG Part 2 analysis, it was found that crossing conditions impose greater risk than berthing conditions and there is significant doubt amongst the masters of the ferries on the Whalsay route that the larger ferries would offer much advantage in times of inclement south easterly weather.

Without providing significantly greater benefit in terms of service, the adverse environmental implications of developing a new terminal on a previously undeveloped site, the additional journey time imposed by the movement of the terminal and the associated economic costs are too high to justify the Grunna Voe option.

Upgrading the terminal at Laxo would enable the larger-sized ferry vessels to berth at the existing site. The environmental impacts of retaining the ferry terminal at Laxo are minimised by making use of existing road infrastructure and constructing on a previously developed site. The capital costs associated with upgrading the Laxo terminal are high, albeit represent the minimum amount required to accommodate a larger-sized ferry vessel.

It is therefore recommended that when considering the Mainland terminal that Laxo is upgraded in order to accommodate the larger-sized ferry vessels.

19.4 Whalsay Ferry Terminal

As with the Mainland terminal, the existing ferry terminal at Symbister on Whalsay would require upgrading or redevelopment if a larger-sized ferry vessel is brought into operation on the Whalsay-Mainland route. The primary issue relates to compatibility conflicts between the existing terminal and any newer, larger-sized ferry vessel(s). Secondary issues regarding the Whalsay ferry terminal relate to marine congestion within Symbister Harbour and associated safety issues.

The options for a ferry terminal on Whalsay are:

(a) Do-Minimum – retain and maintain the existing terminal;
(b) Upgrade Symbister ferry terminal to accommodate larger-sized ferries; and
(c) New terminal at North Voe.

The Do-Minimum option would see the terminal upgraded to safeguard it for future use. Under this scenario, none of the key issues regarding the Whalsay-Mainland ferry link are addressed with the exception of it being the most affordable option.

The proposal to upgrade the existing terminal at Symbister along with the construction of an inner extension provides benefit relative to the Do-Minimum case. The upgraded terminal would be able to accommodate the larger-sized ferry vessel(s), and the inner extension would be able to provide some segregation of the different users in Symbister Harbour.

The issues are also addressed under the proposal to develop a new ferry terminal at North Voe. This option presents the most cost effective means of developing a terminal capable of accommodating larger-sized ferry vessels. By separating the site of the ferry terminal from Symbister marina, congestion is further mitigated and safety further improved.

Both Symbister and North Voe require a degree of additional modelling before final designs could be prepared; North Voe more so as it is considered that tank testing and wave modelling are required for this option.

There is a split amongst the community with regards to developing North Voe versus Symbister. North Voe clearly has the environmental impacts associated with developing a currently undeveloped site but it better addresses the problems in terms of harbour congestion and is more affordable.

Symbister would also require an extremely careful work programme to be produced to allow the works to be undertaken whilst normal operations for both the ferry service and the fishing

industry continue. The decision between North Voe and Symbister has been less clear cut than the other elements but on balance the North Voe option would appear to be the better in terms of deliverability and in terms of meeting the planning objectives set out for the STAG.

It is recommended that, subject to further analysis and technical modelling, the option of developing a ferry terminal at North Voe on Whalsay is progressed as the preferred option. In the event that a North Voe option is no longer considered preferable or feasible, it is then recommended that an upgraded terminal at Symbister with an inward extension is considered.

19.5 Diversionary Port

With regard to the diversionary port at Vidlin, the STAG analysis uncovered two conflicting issues: (a) affordability and (b) the role of the port to improving reliability and operation of the overall service. Although an upgraded port would ensure the reliability of the route and improve accessibility (particularly during the winter season when there are adverse environmental conditions), the cost of upgrading the terminal is high at £3.8 million. Stakeholders have clearly indicated that not upgrading the diversionary terminal is not acceptable.

Work has been undertaken to assess weather patterns, the need for diversions and the cost of such diversions. If a new larger ferry was introduced onto the route but the diversionary port was not upgraded and could therefore only be used by MV *'Linga'* the economic costs in terms of journey time lost have been assessed to be £556,000 (discounted to 2002) over the appraisal period. The option being considered would allow MV '*Filla'* (the Skerries ferry) to be berthed at Vidlin and would offer operational savings to the Shetland fleet. The final details of this would require to be determined in consultation with Skerries and the relevant ferry crews but the savings are considered to be in the order of £780,000 (discounted to 2002) over the appraisal period.

The non-quantifiable economic benefits are thought to be significant as diversions can occur on the route for prolonged periods of time. Restricting the service to one vessel (and only providing 38% of the usual capacity at peak times) would introduce significant doubt for commuters to Mainland based jobs about getting to work. This would all serve to hamper the socio –economics of the Whalsay route. There are also potential operational benefits to other routes in being able to berth the larger ferries in the fleet at Vidlin. Mechanical failure of the Toft linkspan or road closure could be mitigated and allow the ferry service serving Yell, Unst and Fetlar to divert to Vidlin.

Based on the above, it is recommended that Vidlin is retained as a diversionary port and upgraded to accommodate the larger ferry vessels.

19.6 Preferred Option

The STAG analysis examined the benefits and disadvantages associated with each of the option packages. Through careful appraisal against the study objectives and against the five national transport objectives, the recommended preferred Option comprises the following elements:

- Retention and maintenance of MV *'Linga';*
- Introduction of one larger-sized ferry vessel (31 vehicle capacity) as a replacement for MV *'Hendra';*
- Upgrading of Laxo ferry terminal to accommodate larger-sized ferries;
- Construction of a new North Voe ferry terminal on Whalsay; and
- Upgrade of Vidlin to remain as diversionary port capable of accommodating the larger ferry and MV *'Linga'*.

The next steps for this study would be to finalise designs for each of the terminals in order that the works can be procured. For this, North Voe requires a degree of testing to determine the position of the breakwaters and to ensure the facility can be built in the Voe as anticipated.

The STAG study outputs should be revised following such works to ensure the preferred option is still the preferred option and stacks up against the others in terms of delivering against the objectives.

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Appendices

Appendix A: Ferry Users Survey

Appendix B: Review of historic, current and future vessel carryings

Appendix C: Received Comments on Environmental Appraisal

Appendix D: Consultation Meetings and Notes of Discussion

Appendix E: Appraisal Summary Tables (ASTs)

Appendix F: Appraisal Summary Tables (ASTs)

Appendix G: Environmental Appraisal

Appendix H: Study Assumptions and Calculations